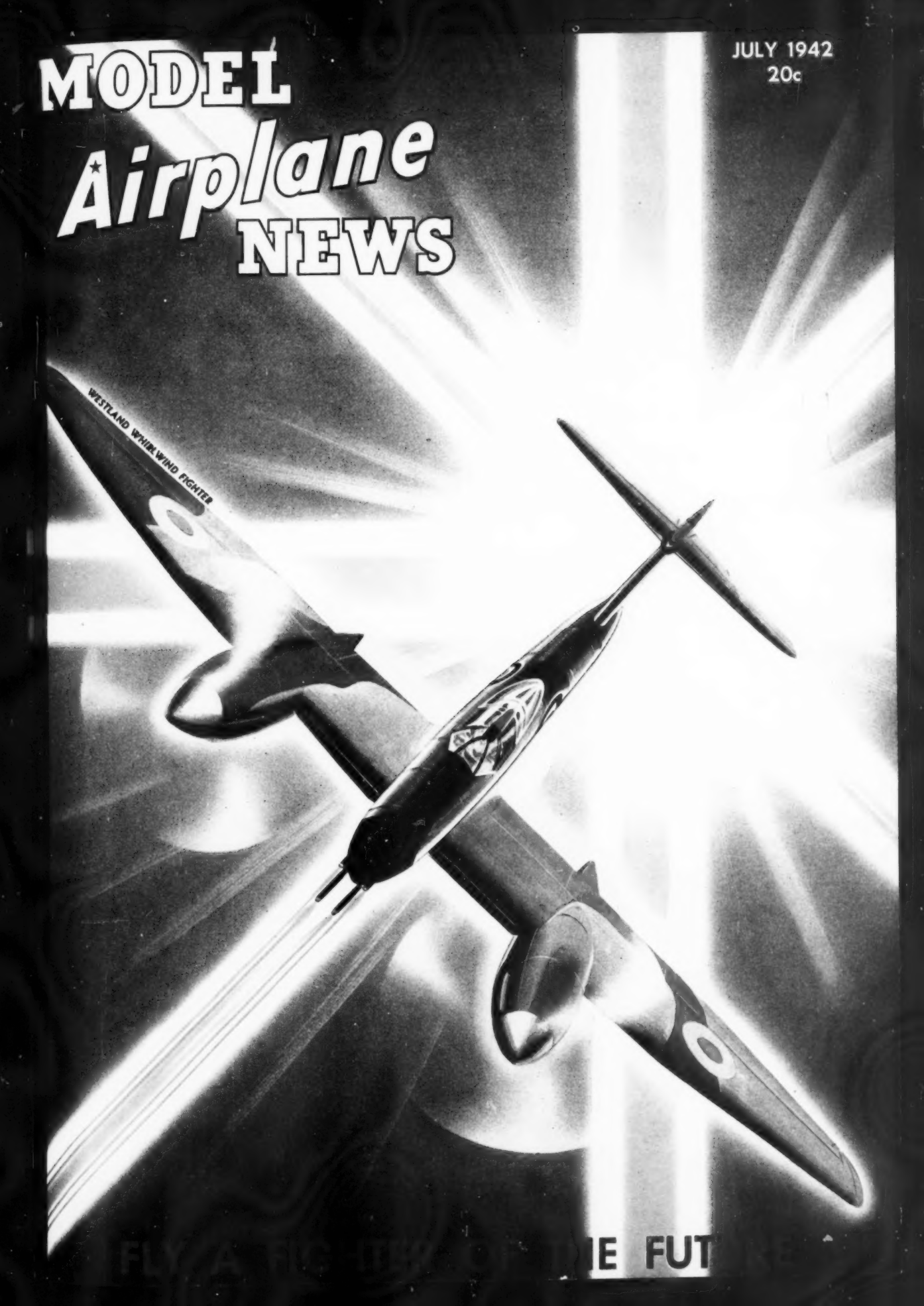
MODEL Airplane NEWS

JULY 1942
20c



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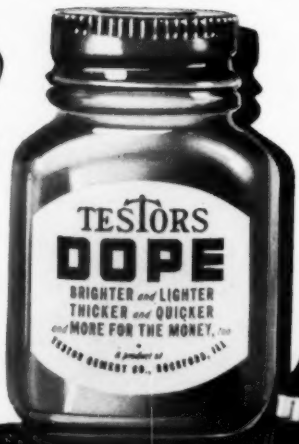

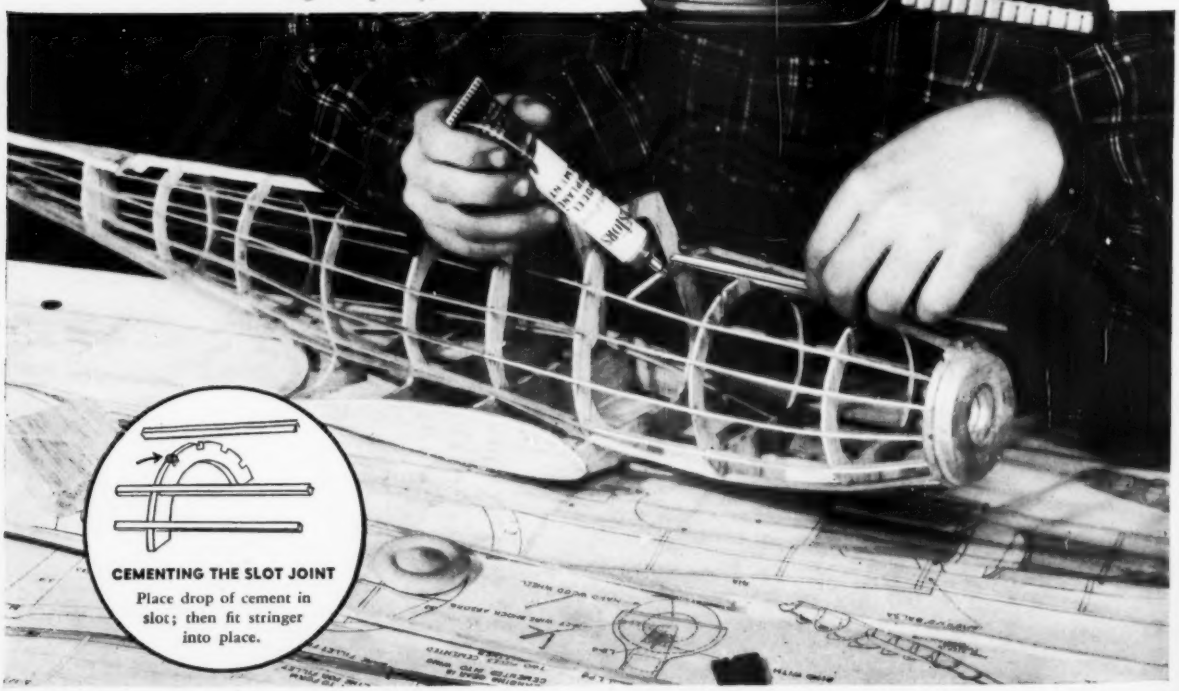

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World's Largest Manufacturers of Model Airplane Chemicals

Special to MODEL AIRPLANE NEWS

THE first unit of airborne infantry (paratroops) has been formed into a new unit of the Army Air Forces, to be known as the Airborne Command. Commanded by Colonel Wm. C. Lee, former C.O. of the famed Fort Benning, Georgia, and pioneer parachute authority, the new command will separate the paratroops from their grounded brothers and so afford a more flexible organization. Charter members of the command (destined to include hundreds of thousands of troops) are the 502nd, 503rd and 504th Parachute Regiments, and the 88th Infantry Airborne Battalion of Fort Benning. Tactics now being experimented with include huge glider trains larger and safer than those used by the Luftwaffe during the invasion of Crete.

The new Blimp Base at Elizabeth City, North Carolina, erected at a cost of $6,000,000, was recently dedicated and accepted by the U.S. Navy while work was still being rushed to completion. The base is one of a chain of such blimp establishments serving the anti-submarine patrol off the frequently raided Atlantic Coast.

Colonel Harold L. George has replaced Brig. Gen. Robert Olds as Commanding Officer of the Ferry Command. General Olds has been transferred to an unannounced position and Colonel George assumes the responsibility of an aviation organization now operating more miles of routes than the entire American commercial airline routes combined. The Ferry Command, in addition to its primary function of flying planes from factories to local centers, now maintains routes throughout the world.

The Navy has perfected and issued to pilots a new-type plastic polarized goggle lens which aids night flying as well as day flying by dampening the glare of light. A dark-adapter is slipped over the lens for night flying which allows no light to stimulate that portion of the retina used in night vision. The new goggles also permit pilots to see to greater depths while flying over water, increasing their efficiency in submarine spotting operations.

Secretary of the Navy Knox has announced that youths with only a high school education will now be eligible for Naval flight training, provided they can pass the required mental and physical tests. "This does not mean," the Secretary emphasized, "that the Navy's standards have been lowered. It only means that a greater portion of the young men of the nation will be eligible for examination." This news will be welcomed indeed to those thousands who have long yearned to be a Naval Aviation cadet but have lacked the required two years of college.

The battle for and against a separate air force has taken a new turn with recent agitation in England for a combined general staff which would "weld the Army, the Navy and the Royal Air Force into a single combat team." The R.A.F. has been repeatedly held up in this country as the epitome of the separate air force, and its outstanding success is pointed out as being a prime reason for the establishment of an Air Force in this country independent of the Army and the Navy. However, Britain's tragic setbacks at Singapore and the Far East has been attributed to a complete lack of cooperation between the three branches.

North American Aviation has returned the sum of $14,000,000 to the Army on the many contracts for bombers, fighters and training planes the company now holds. J. H. Kindelberger, president of the firm, stated: "Increased efficiency has cut the cost of airplane manufacture by 33 1/3 percent from that of the 1940 figures and we are returning this sum to the government rather than accept it as our profit." Although seemingly incredible on the surface, the new excess profit tax would more than have consumed this entire amount.

The raid on Tokyo, recently verified by the U.S., still remains one of the mysteries of the war. Various reports credited North American B-25 bombers with the action, and upon returning to Washington Gen. James Doolittle verified these reports as well as the destructive effect of the raid upon military objectives over a wide area in Japan. An enigma was the reported landing of one of the craft on Russian soil and the immediate internment of the plane and crew. This identical airplane is being sent and welcomed with open arms by the Russians on the Western Front, but on the Eastern front they were interned. Russia and America are allies. America is at war with Japan. Russia and Japan have a non-aggression pact! Just another of the mysterious features of this new war.

A Consolidated "Liberator" four-motor bomber has broken the Newfoundland-to-England flight time record with a hop consuming exactly 400 minutes across the treacherous 2200 miles over-water-hop. This establishes an average speed of 330 miles per hour, fastest ever made.

Speaker of the House Sam Rayburn recently told America what it had long waited to hear: actual facts and figures on aircraft production. "We are now producing 3300 airplanes a month and this is steadily rising. These production rates will give us 125,000 airplanes in 1943, 100,000 of which will be combat airplanes."

C. R. Smith, President of American Airlines, and builder of the giant network of airports, planes and equipment it operates, has been called to duty by the War Department because of his "specialized knowledge in the operation of aircraft which can most effectively be utilized by the Army in the fulfillment of its requirements in our war efforts," states Lt. General W. H. Knudsen.

Mikhail Gromov, renowned Russian

(Continued on page 60)

13TH YEAR OF PUBLICATION

MODEL Airplane NEWS

JULY, 1942 VOL. XXVII, No. 1

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Edited by
Charles Hampson Grant

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"I enlisted in the Army Air Corps immediately

. . . . . and the aid my modelbuilding

—writes J. W. H. of the Air Corps Technical

Continuing, he states: "The building of scale models made it possible for me to easily catch on to the fundamentals of military aircraft, especially the construction. I knew practically all about them only on a smaller scale. Of course, modelbuilding can't

AN AVIATION MILESTONE • C-D • DESIGN

Order your kits NOW while stock lasts

Modelbuilding is proving invaluable in helping America to

"Get 'Em Flying Quicker—and Keep 'Em Flying Longer"

is the overwhelming opinion of letters we've received from men in our Air Forces from all corners of the country.

★ ★ ★

"WE use your models here at the school," writes Instructor J. L. P. at the Naval Air Station in California. "I started building Cleveland Models in 1936, still do—and find this experience of great service in instructing my students in the theory of flight, and the forces which sustain or hinder the action of the plane in the air."

★ ★ ★

"I RECENTLY passed the Aviation Cadet examination with a high score," writes F. J. T. from "somewhere" in Louisiana, "and I credit 20 points of that to my knowledge gleaned from modelbuilding."

★ ★ ★

"I AM an American in the Royal Canadian Air Force," writes W. H. from "somewhere" in Canada, "and like with many of the fellows here, modelbuilding was my hobby as a civilian. The knowledge gained in my years of modeling has helped me immensely in such classes as aerodynamics, aero engines, airmanship, aircraft recognition and almost every course we are required to study."

★ ★ ★

"I HAVE been building model airplanes since 1927," writes R. A. L. of the U. S. Army Air Corps in Massachusetts, "and have every Cleveland Kit made except four. I was drafted a year ago this month and was an Airplane Mechanic in Colorado all last summer at the Air Corps base there. Last fall I was an Inspector on the Final Assembly line of Bombers at one of our largest manufacturers until I was recalled this winter and sent here. I feel that Cleveland Kits have helped me considerably in teaching me various types of construction used extensively in full size planes. Every American boy should build Cleveland-Designed Kits, each one is indeed an Aviation Milestone. May you continue to teach Young America and bring joy to all modelbuilders, young and old."

★ ★ ★

EVEN key men in the war planning program state that America's excellent air consciousness is due to young America's many years of building models. To get 'em flying quicker—to keep 'em flying longer—modelbuilding must continue. We trust our Army and Navy officials will approve a high priority number for the industry at once, so we may continue to teach and train more men needed soon.

Model of the Month No. 1

(For those who like the big "egg layers")

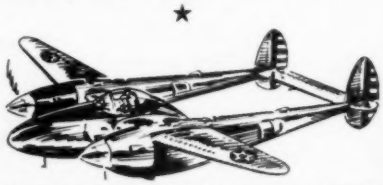
LOCKHEED HUDSON BOMBER

This now famous Lockheed Hudson bomber so extensively used by the R.A.F. and now for our own use over the Pacific, needs no introduction. It has wide acceptance by the British Coastal Command operation over the North Sea and Channel areas, and its sturdiness and endurance have gained for it a high reputation with the British crews. Hudsons are now patrolling Australia constantly. (As we go to press, our government still has made no admission regarding the first historic Tokyo bombings, but Hudsons were believed to be among the ships in action.) It is a beautiful model correct in outward appearances to minute detailing, retractable landing gear and with its "full dress" of camouflage coloring. The model with a span of 48¾" flies fast and furiously as does the prototype which has an estimated (although secret) performance of 315 m.p.h. "fully loaded with eggs." Complete Master Kit SF-95 with large cans of dopes, only... **$7.50**

The Deadly AIRACOBRA

Thousands of these are now in action for the United Nations against the enemy—and giving a most amazing account of themselves. Deadly as the cobra, when they sting, they kill. It is a beautiful model and due to its long projecting nose, makes a "perfect" flying scale model with a high speed performance that will please the most serious, as well as the beginning model builder. Span 25½". Complete Master Kit SF-76, only..... **$3.00**

★



Cleveland's Superdetailed, "Supercharged"

LOCKHEED P-38 "LIGHTNING"

Beautiful ¼" scale master miniature of "the world's fastest fighter"—the one that's by and gone before you even hear it. And C-D engineers have gone the limit in making this model as "terrific" as the prototype. Loads of detail! Big 38¾" span. Superpowered twin-motor job that's speedy, realistic and an absolute "must" among model builders who want the newest and best. Master Kit SF-85 ..... **$4.00**

CURTISS GOSHAWK F11C-2, Span 23⅝". Kit SF-49 only, **$3.00**

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CLEVELAND

"THE MODELS THE MEN IN THE

after the yellow belly attack on Pearl Harbor

experience has given me knows no bounds."

School in Mississippi.

teach you all about the Course I am taking, but I'm willing to bet that 50% of an airplane mechanic's course can be learned just by building good model planes. The construction of planes is practically the same as models, especially in Cleveland Kits."

Model of the Month No. 2

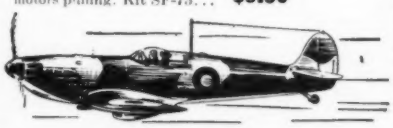
(For those who like the fighters)

HAWKER "HURRICANE" NIGHT FIGHTER

This design was selected duplicating the "Mark I," which now comprise the famous Hurricane night fighter squadrons of fighters protecting English coastal towns and other large areas, protecting English aircraft in the historic battle for supremacy in the air for the protection of freedom throughout the world. The model with a span of 30" has been repeatedly requested by model builders everywhere. It is camouflaged and very colorfully decorated with the proper insignia on both the fin and fuselage sides and also on the top and bottom of the wing in the most modern up-to-the-minute authentic colorings of RED, WHITE, BLUE and YELLOW. It is otherwise as authentic as possible to be made, including retractable landing gear. Order this Master Kit SF-78 today, complete with camouflage coloring, only **$3.00**

GRUMMAN SKYROCKET

Big 31½" scale job of America's new twin motor 450 m.p.h. "Terror of the Skies." Fast flyer with both motors pulling. Kit SF-75... **$3.50**



BRITISH SPITFIRE

This realistic Cleveland model of the "Pride of the RAF" is the pride of any builder. Beautiful 27¾" model of England's popular interceptor fighter. Large wing area makes this an excellent flyer. Speedy. Master Kit SF-73..... **$3.00**

CURTISS P-40 "TOMAHAWK"

Deadly in swiftness, accuracy and fighting efficiency. Christened "Tomahawk" by the British. Beautiful 28" span model. Long projecting nose makes it an excellent flyer. A beauty to build and to fly. Kit SF-77..... **$3.00**

German ME-109 Messerschmitt

Sleek 24½" model of the Nazi's mass production fighter. Capable of good fast flights. Master Kit SF-74 ..... **$3.00**

23¾" CURTISS HAWK P6-E. Kit SF-21..... **$3.00**

Get in the Gas Model "Winnings" with the famous "Supercharged" PLAYBOYS

The Playboy in Flight

PLAYBOY SR. Class C Gas. Huge 80" span. Breaking records everywhere. 800 sq. in. Kit GP-5017 (except motor unit) **$4.95**

PLAYBOY JR. Class B Gas. Span 54½" (360 sq. in.) Kit GP-5006 (except motor unit).. **$2.95**

BABY PLAYBOY Class A. For Atom motor or rubber powered. Biggest gas value on market. Span 33". Complete Kit GP-5008 (except motor unit)..... **$1.00**

REARWIN SPEEDSTER. (Complete except motor 64¾" (2" scale). Kit GP-69. unit) **$8.50**

STINSON RELIANT Huge 82½" (2" scale) Kit GP-66. (Complete except motor unit)..... **$12.50**

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WINGÉD CARAVAN

How American airmen are flying equipment to the war's far-flung battlefronts

by

ROBERT McLARREN

(Top) Official insignia of the U.S. Army Airforce Ferry Command, composed of both Army and civilian pilots. (Above) Ferry Command pilots with their parachutes and personal baggage report for duty

(Left) Pilots relax at field recreation room awaiting takeoff orders. (Right) Col. Robert Baker checks over map with cardboard disks showing location of planes on their trips from factory to destination. (Below) Group of Ferry pilots hasten to their planes after receiving their instructions

NO REMOTE corner of earth will escape the terrible mechanized juggernaut of this fantastic second World War. Across the frozen Russian tundra, past the parched African desert, out over the Pacific expanse to the rugged Himalayas echoes the sound of battle, death and destruction. This is THE war which has threatened mankind for eons of time, the final convulsion preceding the birth of world state in which man can pursue his own destiny in peace.

While the whole of the first World War was fought principally on the continent of Europe (a vast majority of it on a small 200-mile stretch in northern France), this greater and more ghastly war is being fought throughout the seven seas and continents of this planet and in the air eight miles above it.

That these vast and distant battlegrounds strain the sinews of soldiers who must travel hundreds, even thousands of miles into action has been clearly shown. But a hundredfold times more it strains the real sinews of war: the *supply lines!* It might easily tax the imagination of the hometown citizen to imagine a route *twelve thousand miles* long over which tons upon tons of military equipment is passing daily. Yet such is the torturous route of the Ferry Command, that crew of steel nerves and tireless eyes who must deliver the goods across these interminable distances.

Most assuredly it is a gigantic job; closer to impossibility than any of the astounding achievements that have made this new World War unique in history. For without this service of supply no army, navy or air force could long remain in action.

To supply a military force requires the most complex and the most efficient organization humanly possible. A myriad of separate and distinct items must be designed, manufactured, delivered and used before preparedness becomes victory. Carrying tiny rolls of adhesive tape and monstrous bombardment planes, the supply lines function as giant steel cables traversing the world.

An air-war means airplanes: thousands and more thousands of them. But building them is hardly enough, flying them in action hardly possible without delivery: "getting 'em there!" And this need has created the Ferry Command, a separate force within the Army Airforces.

With the gigantic strides made by aircraft manufacturers, production figures have been climbing stratospherically. We cannot, for obvious reasons, tell you how many planes America is producing daily; but the goal was 50,000 this year—and

All photos by Acme

leaders have stated that we are ahead of schedule!

That was job No. 1 on the list. Job No. 2 is the transportation of these planes to forces beyond the seas: Royal Air Force, Russian, Chinese, Dutch, Australian and our own airforces.

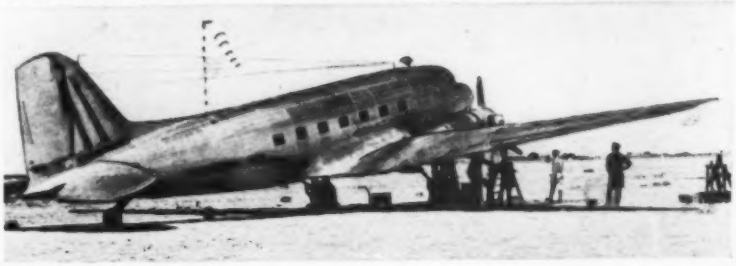
Since pilots were ordered directly to service squadrons after graduation from Army Airforce training centers, the Ferry Command could look for little material in that direction. To set up its own schools would only be a duplication of effort, insofar as the present schools are being expanded as rapidly as demand necessitated.

One huge supply source had not been tapped, but now it is rapidly being exhausted: the commercial and private pilots. These civilians seem to fit the requirements perfectly, chief of which is experience, hours in the air, and hundreds and thousands of flying hours handling every type of airplane under the sun. And for the giant multi-engine planes, few men could better fill the task than trained scheduled airline pilots. In addition, the latter for the most part were former Army and Navy pilots, graduates of military schools, and even a large number of commissioned officers in the Reserve Corps.

Out on the great white dunes of New Mexico a vast organization sprang into existence with hangars, runways, service shops, mechanics, instructors, radio and supply men seemingly overnight. These civilian pilots were quickly rushed through the course; quickly because their training consisted chiefly of brush-up courses and check flights. Hundreds per month were graduated, commissioned and rushed into service. Now there are thousands hard at work at the toughest and loneliest flying job in the world: the ferry pilot's vital role in this maddening tempo of war in which a drumlike cadence repeats "Deliver . . . deliver . . . deliver . . ."

Within the United States the job was a big one, but only a preview of a gargantuan task lying ahead. Delivery schedules had to be posted daily, even hourly, from dozens of giant aircraft factories. Prime object was to fly the planes from the manufacturer's fields as fast as they came off the

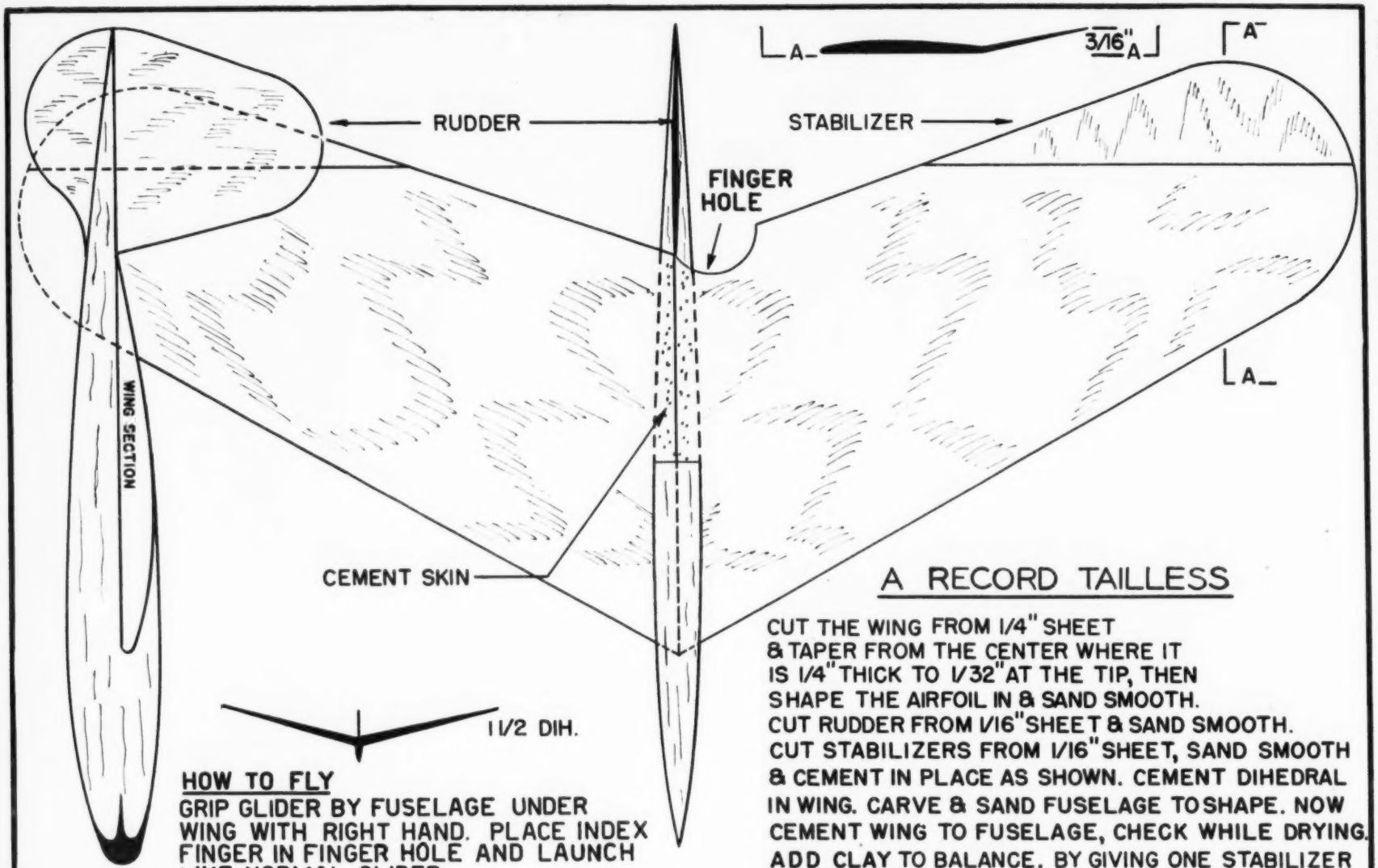
(Continued on page 46)



(Top) A Martin B-26 takes off from the factory field for delivery. (Above) A Douglas Transport is serviced at one of the African desert airports on its way to the Near East. (Below) Sleeping quarters at one of the trans-African Ferry Command bases; note how pilots "rough it" with steel beds and soft mattresses. (Bottom) En route to the Near East battlefront this transport is given a regular inspection by mechanics

"TINY" TAILLESS GLIDER

Build and Fly This at School or Camp



A RECORD TAILLESS

CUT THE WING FROM 1/4" SHEET & TAPER FROM THE CENTER WHERE IT IS 1/4" THICK TO 1/32" AT THE TIP, THEN SHAPE THE AIRFOIL IN & SAND SMOOTH. CUT RUDDER FROM 1/16" SHEET & SAND SMOOTH. CUT STABILIZERS FROM 1/16" SHEET, SAND SMOOTH & CEMENT IN PLACE AS SHOWN. CEMENT DIHEDRAL IN WING. CARVE & SAND FUSELAGE TO SHAPE. NOW CEMENT WING TO FUSELAGE, CHECK WHILE DRYING. ADD CLAY TO BALANCE. BY GIVING ONE STABILIZER MORE NEGATIVE THAN THE OTHER THE GLIDER CAN BE MADE TO TURN.

HOLDS CITY OPEN RECORD – 2 MIN. 28 SEC.

HOW TO FLY

GRIP GLIDER BY FUSELAGE UNDER WING WITH RIGHT HAND. PLACE INDEX FINGER IN FINGER HOLE AND LAUNCH LIKE NORMAL GLIDER.

BY F.V.B. EHLING SCALE FULL SIZE

THIS "STICKER" ALWAYS WINS!

A champion designer and flier tells you how to build this consistently winning stick model

by **RAY BEAUMONT**

Light, simple construction, single-blade propeller and efficient stable design makes this plane supreme as a contest winner

EVERY modeler who has entered a contest feels that some day he will build a first prize model. Time and again after working for weeks on a model, he enters a ship in a contest only to find that he didn't do something just right. So after the contest home he goes, confident that he has found the faults in his model, will correct them and most certainly win the next meet.

But winning models are not built overnight; test after test must be made, experiments with various wing and stabilizer arrangements, trying different airfoils. Reading advice given by successful contest winners stimulates ideas that beget other ideas and in this way new models are created. Then the builder is on his way to success.

The little stick model shown here has proved to be a real contest ship, winning three first places in the P.M.A.A. contests and taking fourth place at the New Jersey State Championships with a single flight of 9 min. 36 sec. It has invariably proved to be a one flight ship attested by the fact that the writer has lost track of the models of this ship that he has lost. It is very easy to build and uses a square fuselage blending into the spinner for utmost efficiency. The arrangement gives a fast climb and the stick really "gets up there," then settles into a beautiful glide, the result of a little extra time spent on the wing formers.

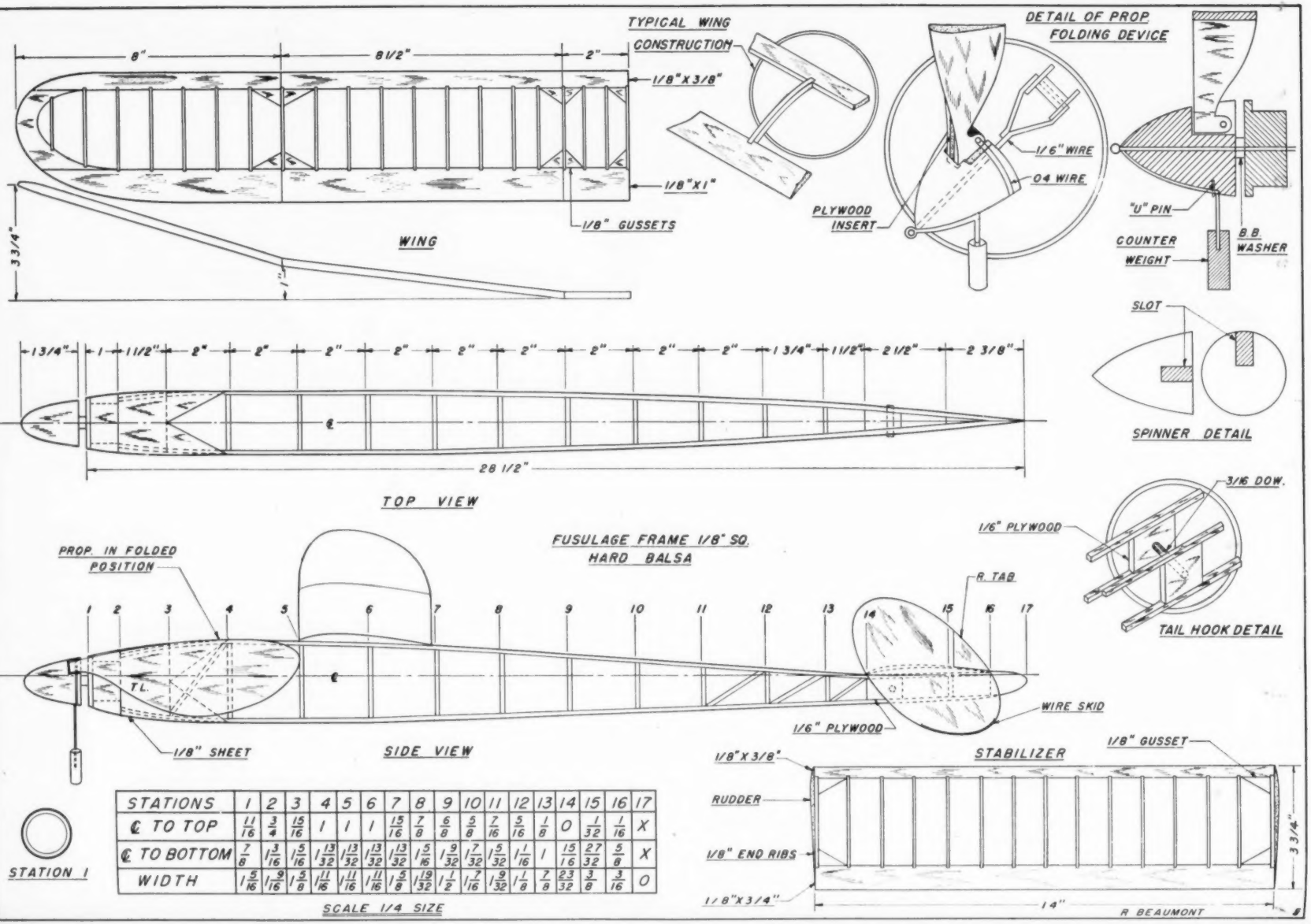
This ship costs very little but will give you big performance.

CONSTRUCTION: Begin by enlarging the plans to full size, but make sure they are drawn exactly right. Lay the drawing on a smooth board and cover with a piece of wax paper to save the drawing as you build. This little extra precaution saves the trouble of making new plans from time to time.

FUSELAGE: The longerons are of perfectly straight grained and hard 1/8" square balsa. Place them exactly on the drawing of the sides and pin in position by placing the pins on each side so the longerons will not be weakened. Next add the cross braces placing the uprights in position first. Take time to do this right, as perfect construction will give you a perfect job. When the first side has been laid down place the other side on top and when dry separate with a razor blade.

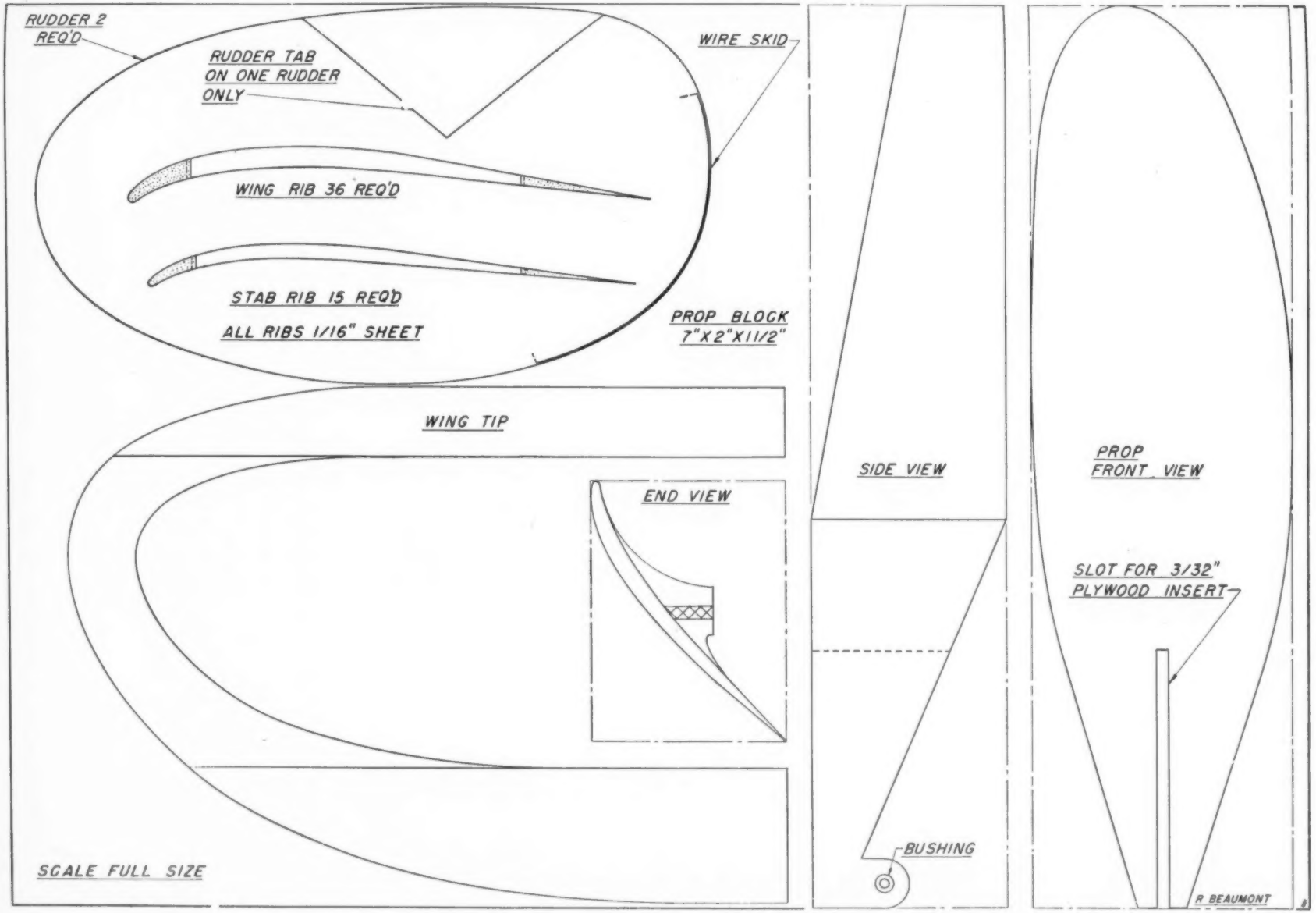
Now join the sides together starting at

(Continued on page 51)



STATIONS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
℄ TO TOP	11/16	3/4	15/16	1	1	1	15/16	7/8	6/8	5/8	7/16	5/16	1/8	0	1/32	1/16	X
℄ TO BOTTOM	7/8	1 3/16	1 5/16	1 13/32	1 13/32	1 13/32	1 13/32	1 5/16	1 9/32	1 7/32	1 5/32	1 1/16	1	15/16	27/32	5/8	X
WIDTH	1 5/16	1 9/16	1 5/8	1 11/16	1 11/16	1 11/16	1 5/8	1 19/32	1 1/2	1 7/16	1 9/32	1 1/8	7/8	23/32	3/8	3/16	0

SCALE 1/4 SIZE


RUDDER 2 REQ'D
RUDDER TAB ON ONE RUDDER ONLY
WIRE SKID
WING RIB 36 REQ'D
STAB RIB 15 REQ'D
ALL RIBS 1/16" SHEET
PROP BLOCK 7"X2"X11/2"
WING TIP
END VIEW
SIDE VIEW
PROP FRONT VIEW
SLOT FOR 3/32" PLYWOOD INSERT
BUSHING
SCALE FULL SIZE
R BEAUMONT

MODELING YOUR FUTURE IN AVIATION

Official Air Youth course in elementary aeronautics

by CHARLES H. GRANT

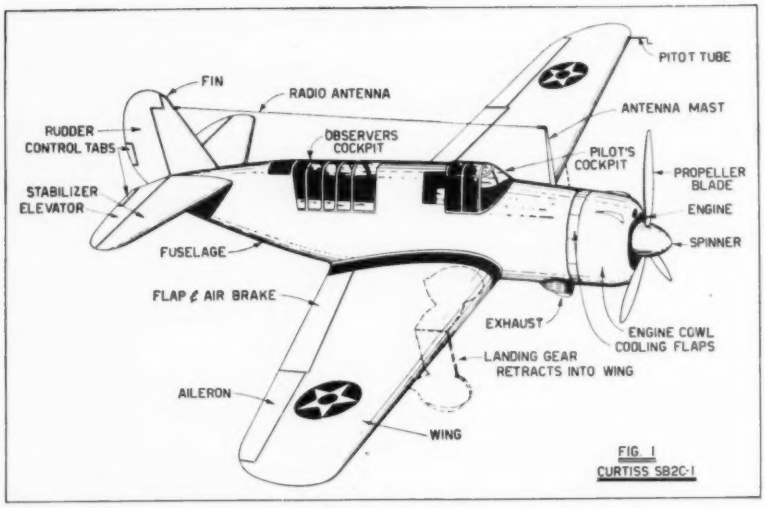


FIG. 1
CURTISS SB2C-1

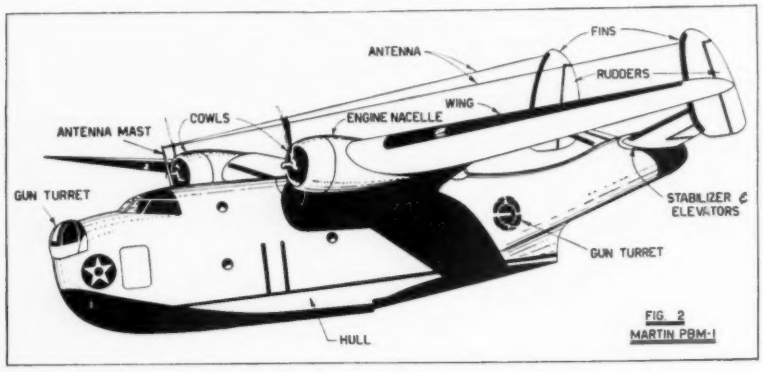


FIG. 2
MARTIN PBM-1

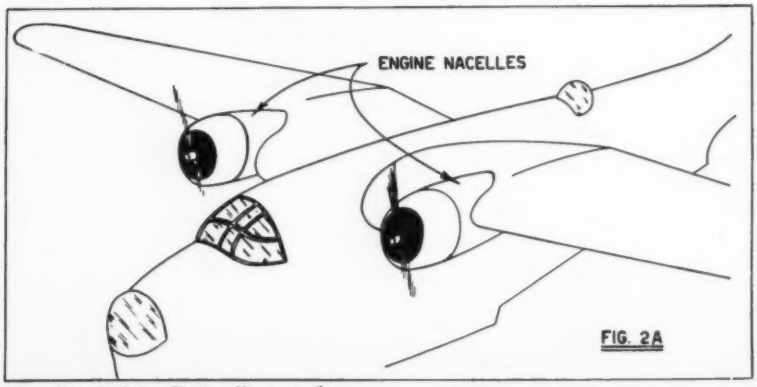


FIG. 2A

ARTICLE 1

The Airplane and Its Evolution

FAR below, the blue sea shimmers in the tropical sun. Puffs of feathery fringed clouds loafing before a gentle breeze cloak the streaking dive bomber from the view of a massive battle cruiser. The plane is nearing its target which apparently is unaware of flying menace high above. As a break in the cotton carpet brings the grey, grim monster into full view, the pilot braces for action. Gripping his controls tighter, he pushes them forward slowly but with deliberation until the crosshairs of the dive-sight split the target. Down, down plunges his winged projectile with propeller screaming like a thousand unleashed demons. Dirty black puffs suddenly burst into being to right and left, as the enemy, now fully aware of its danger, sends shells rushing skyward to welcome the onrushing plane.

Oblivious to this deadly greeting the pilot never wavers. Increasing air pressure grips his throat, wrists and heaving chest in a vain attempt to crush life from his body, but the battle cruiser remains fixed in his sight ring. Larger, larger it grows—closer, closer it comes—with each lingering second; expanding like some evil genii until suddenly its massive form seems to fill the cramped cockpit. The pilot's hand moves like a flash to the release and the lightened plane, unleashed from its load of death, swerves upward in a shrieking arc.—A moment of agonizing suspense—then with a convulsive roar—the steel monster is ripped by an exploding universe.

Without lingering to watch the sea suck the stricken ship into its depths, the plane climbs into the sheltering clouds. Again David conquers Goliath; the small, fragile but deadly warplane destroys many times its weight and cost in sea power.

This incident is typical of many that have taken place in the Pacific, proving the airplane to be the most vital weapon in modern war.

On the other hand it has and will again be used to serve and build the welfare of human beings instead of destroying them. Even now, huge planes are spanning continents and oceans; carrying mail, express, freight and passengers from one nation to another with future promise of fast comfortable transport between all parts of the world. We are inspired to ask: what is this miraculous mechanical bird that man has created? How was it conceived and developed to its present efficient but complex form? How is it constructed? How

and why does it fly?

It is destined to play a vital part in our lives—so let us examine it closely.

Fig. 1 shows a typical modern warplane; a U.S. Navy Curtiss SB2C-1 dive bomber, similar to the plane described above. Though appearing complex, basically it is quite simple; made up of a few essential elements.

Most important is the wings which, by their forward motion, generate lift required to keep the plane in flight or to climb. Second is the power plant or engine. In the diagram this is located at the nose of the fuselage within the cowl. The propeller mounted on the engine shaft uses the power by acting upon the air to pull the airplane forward. The third factor is the stabilizing surfaces. These are the fixed horizontal stabilizer and vertical fin at the rear of the fuselage. Fourth is the framework or structure which holds together the essential parts, namely, the wings, powerplant, propeller and stabilizing surfaces; commonly called the fuselage. In the dive bomber the fuselage forms the main body, enclosing the engine, pilot and other equipment. Provided the airplane is stable no other parts are required for flight.

However the airplane must take off and land so all planes are equipped with some form of landing gear. The dive bomber is a landplane, so landing gear consists of wheels mounted at the lower ends of struts extending downward from the wings, shown by broken lines in Fig. 1. After the airplane has left the ground the landing gear is not necessary for flight and if not retracted, Fig. 4, must be dragged through the air, causing unnecessary resistance and loss of power. So landing gear on modern planes is made retractable, folding upward and fitting neatly into the underside of the wing. It is let down again when it is desired to land the ship, as in Fig. 1.

All airplanes include these fundamental elements in one form or another and differ only in elemental arrangement, the number used or their shape. For instance, Fig. 2 shows one of the latest type Martin patrol boats. Because it must land on the water, wheels are replaced with a boat hull; this serves as landing gear for this type of airplane.

Also you will note that there are two engines and instead of locating them in the nose of the fuselage, or boat hull, they are placed in individual compartments attached to the wing, called nacelles, Fig. 2-A. These support and streamline the engines, reducing their resistance. In Fig. 1 the dive bomber has one vertical tail surface but in the flyingboat two are used, located at each end of the stabilizer. The latter is slightly unusual with ends turned upward at an angle forming a very wide or shallow "V." One set of wings is attached to the upperside of the fuselage hull, instead of the lower as in the case of the dive bomber. They must be placed high in this type of airplane to hold the engines well above water and spray when taking off or landing.

Fig. 3 shows another type of waterplane Curtiss SO3C-1; it is called a single float hydro airplane. Unlike the flyingboat, the fuselage and float are separate, the latter usually being connected by struts to the fuselage or by a single pylon like the plane in the figure.

(Continued on page 36)

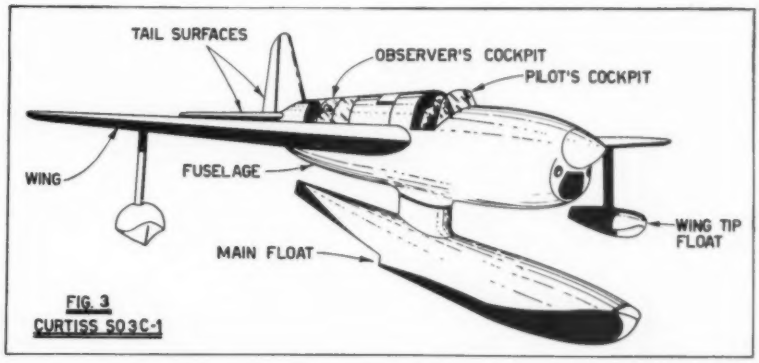


FIG. 3
CURTISS SO3C-1

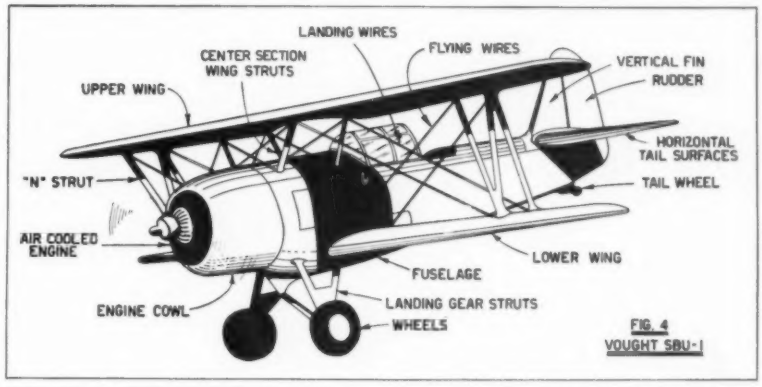


FIG. 4
VOUGHT SBU-1

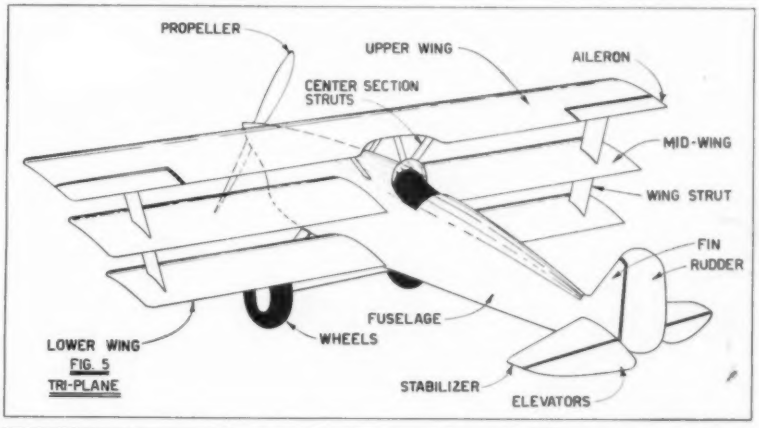
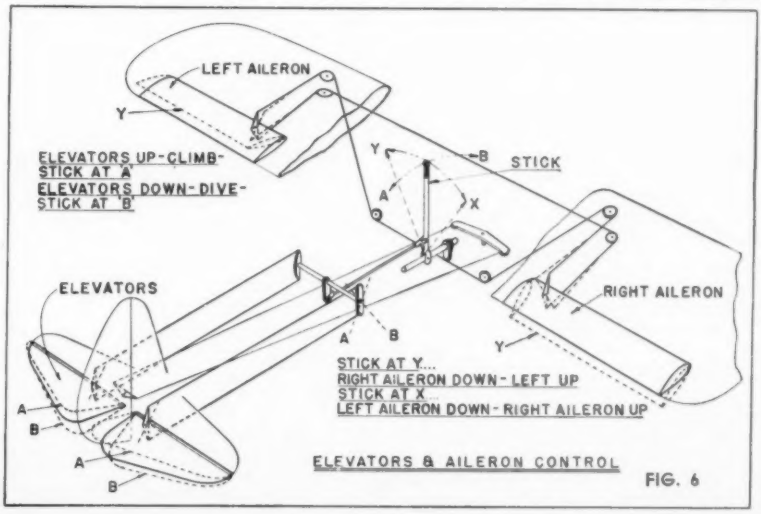


FIG. 5
TRI-PLANE



ELEVATORS & AILERON CONTROL

FIG. 6

SKY SCOUTS

Learn to spot enemy planes and help defend America

LESSON 6

GREETINGS Sky Scouts—

Your official roll call is now almost 1000, extending from Maine to California, with more prospective spotters signing up every day!

Sky Scouts was organized to teach American youth how to recognize enemy planes quickly in the event of a raid. In this way every Sky Scout can be of service to his country.

If you wish to join it is easy to qualify: simply send in correct answers for two sets of silhouettes which appear in MODEL AIRPLANE NEWS under the heading of Sky Scouts. (One new set is printed in each issue.) Write your name, address and number of the set of planes, such as No. 1a, 2a, 3a, etc.—also be sure to fill in and send the coupon at the end of this article, or make a copy of it.

When you have submitted correct answers to two sets of silhouettes you will qualify as a Sky Scout and receive a silver Sky Scout pin; when you have sent in all 12 sets of correct answers you qualify as an Expert Sky Scout and then will receive a gold pin.

To enable late comers to complete all 12 sets, previously published sets will be republished from time to time. In this issue silhouette sets No. 1, 2, 3 and 4 are reprinted on pages 40 and 42. Therefore, if you have missed previous installments, send in the answers to No. 1 to 4, as well as No. 6, the current set.

All answers should be mailed to headquarters: MODEL AIRPLANE NEWS, 551 Fifth Avenue, New York City.

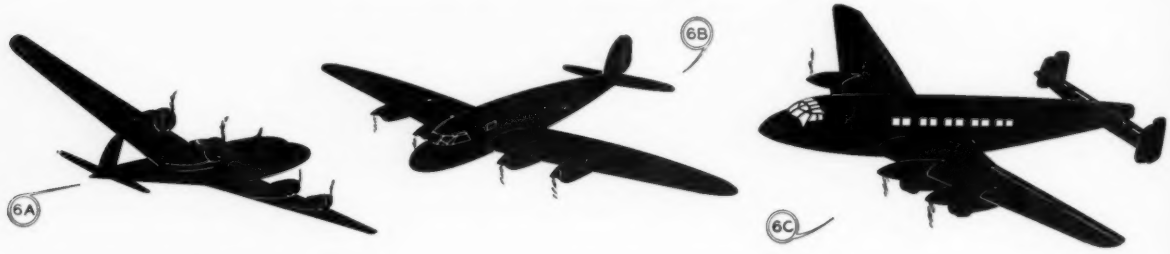
We are arranging to form a unit of all qualified members who reside in one community. Cards containing a list of all members in a single community are being sent to each of these members requesting that they get in touch with the other Sky Scouts listed on the card. This will enable units to be formed quickly.

When members of a unit qualify as Expert Sky Scouts their names will be sent to their local defense headquarters along with a recommendation that they be considered available as plane spotters.

Sky Scouts—you are invited to make this column your own. Send in your ideas or some timely news items. If any strange planes pass over your community, or if some unusual incident occurs, tell us about it so that we can pass it on to other Scouts through the medium of this column. Information that you may feel is insignificant often will prove to be helpful in another way.

Until next month—"keep your eyes peeled"!

(Continued on page 40)



Description of Silhouettes No. 6

PLANE 6A—The Focke-Wulf FW 200 "Condor," troop transport equipped with four B.M.W. 132 G air cooled engines each developing 720 hp. The craft is capable of carrying 30 fully equipped soldiers plus crew of four. Wingspan is 108 feet 3 inches; length, 78 ft. 3 in.; height, 20 ft. Empty, ship weighs 21,560 lbs.; weight loaded, 32,120 lbs. The Condor has a maximum speed of 233 m.p.h. at 13,000 ft. Range is 775 mi. at 217 m.p.h. and a rate of climb of some 1,300 feet per minute.

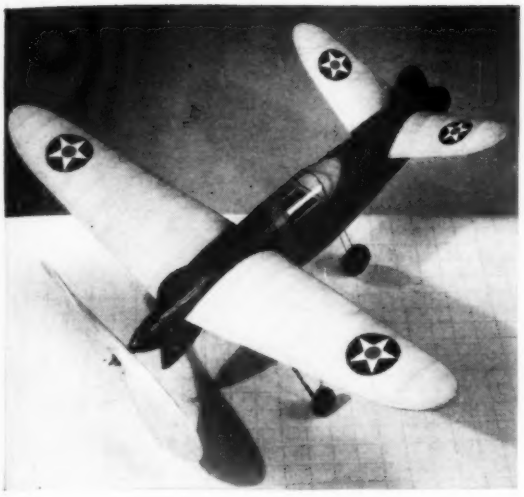
PLANE 6B—The Heinkel HE 116, troop and freight transport powered by four Herth HM 508 G engines each developing 270 hp. It has a useful load capacity of 6,094 lbs. Wingspan is 72 ft. 2 in.; length, 44 ft. 11 in.; height, 12 ft. 6 in. Weight empty is 9,592 lbs. Known to have a maximum speed of over 230 m.p.h., its range is 2,795 miles with service ceiling of 21,650 ft. The ship is of monocoque design fabricated of wood and covered with ply.

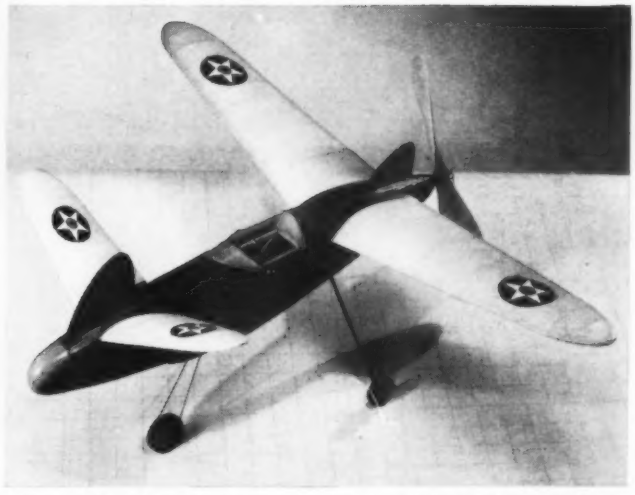
PLANE 6C—The Junkers JU 90, well known troop transport. Powered by four B.M.W. 132 H engines, each developing some 880 hp., it carries a crew of three and accommodated 40 fully equipped soldiers. The JU 90 is capable of 217 m.p.h. at 3,600 ft. altitude, with service range of 1,300 mi. Service ceiling is said to be 18,000 feet. Wingspan is 114 ft. 10 in.; length, 86 ft. 3 in. Weighs 35,000 lbs. empty; 50,600 lbs. loaded. It is of typical Junkers all-metal construction and cumbersome in appearance. It features sharply sweepback wings, twin rudders and "floating" elevator.

General Specifications of Japanese Planes Presented in Silhouette Form in Previous Sky Scout Articles

NAME	TYPE	POWERED BY NO.	ENGINE	HP	SPEED	PLACES 1	2	3	4 or more	WINGS 1	2
NAKAJIMA 90	FIGHTER	1	KOTOBUIK	450	175	X					X
" 91	"	"	JUPITER	450	200	X				X	
" 94	"	"	NAKAJIMA III	550	185		X				X
" 95	"	"	KOTOBUIK	550	215	X					X
" 96-2	"	"	JUPITER	550	236	X				X	
" 97	"	"	"	550	241	X				X	
" 98	DIVE BOMBER	"	?	?	?		X			X	
KAWASAKI 95	FIGHTER	"	B.M.W.	600	?	X					X
MITSUBISHI 98-1	DIVE BOMBER	"	?	?	?		X			X	
" KARAIGANE	FIGHTER	"	MITSUBISHI A-14	800	310		X			X	
NAKAJIMA 90-11	RECONNAISSANCE	"	JUPITER	450	185		X				X
KAWANISHI 95	"	"	?	?	?		X				X
" 96	"	"	?	?	?		X				X
NAKAJIMA 96	TORPEDO-SHIP	"	MITSUBISHI KINSEI	950	158			X			X
MITSUBISHI OTORI	BOMBER	2	KOTOBUIK III	550	240				X	X	
" 96-2	"	"	MITSUBISHI KINSEI	950	195				X	X	
NAKAJIMA 19	"	"	" A-14	870	225				X	X	
MITSUBISHI 93 B	"	"	JUPITER	450	155				X	X	
" 92	"	"	?	?	300				X	X	
FIAT BR20M-TYPE 98	"	"	FIAT	1030	270				X	X	
KAWANISHI 90 1	FLYING BOAT	3	HISPANO-SUIZA	650	140				X	X	
" 90 2	"	"	KAWANISHI BUZZARD	825	135				X		X
" 91	"	2	" 91	600	135				X	X	
HIRO 97	"	4	HISPANO-SUIZA	720	210				X	X	
MITSUBISHI HINAZURU	TRANSPORT	2	LYNX IV-C	?	200				X	X	

X = HIGH WING X = LOW WING





The canard model with features changed from original Army design to make stable flight possible. Planes of this type must be steered by a rudder at the nose as shown. (Below) The proposed design for full scale Army canard pursuit plane, now discarded

FLY A FIGHTER OF THE FUTURE

Vital features required in all canard airplanes—and how you can build a flying model of a possible future Army canard pursuit

Acme

by CHARLES H. GRANT *and* FRANK EHLING

RECENTLY the United States Army, in search for more efficient, high performance aircraft, investigated the possibilities of some unique designs. A number of them were discarded as impractical or offering no advantage over present types; one of these was a canard pusher pursuit plane pictured on this page (right lower picture).

Whether or not this plane was considered representative of canard type designs is not known; however, experienced model builders will unquestionably note a number of basic errors in the conception shown here. This doesn't mean that an efficient canard type pursuit plane cannot be made, but rather that certain vital requirements of this type of ship have been overlooked in the Army design.

Most full scale canards incorporate one vital error, namely, that the center of gravity is not far enough forward. Naturally this is not obvious to the casual observer but it makes such a ship extremely dangerous to fly. When the c.g. is far back the plane stalls quickly and suddenly tail-slides. Early fliers of this type of ship were content with correcting this condition by means of the controls rather than correcting design.

In all pushers, the area of the wing times the distance from its center to the c.g. should be much greater than the area of the front elevator times the distance from its center to the c.g. This is a basic rule for pusher types, and unless it is carried out serious stability troubles result.

The Army design here flaunts the bugaboo of the stall also in respect to another feature, namely, the elevator. It is essential in such a ship that the front wing stall before the rear wing. To provide this condition the front wing, or elevator, should have much more dihedral than the rear, or main wing. Thus at slow speeds, or when in a stall, the air spills out from the front wing allowing the nose to drop and the ship to regain its equilibrium. The front wing of the design shown would make this plane impractical.

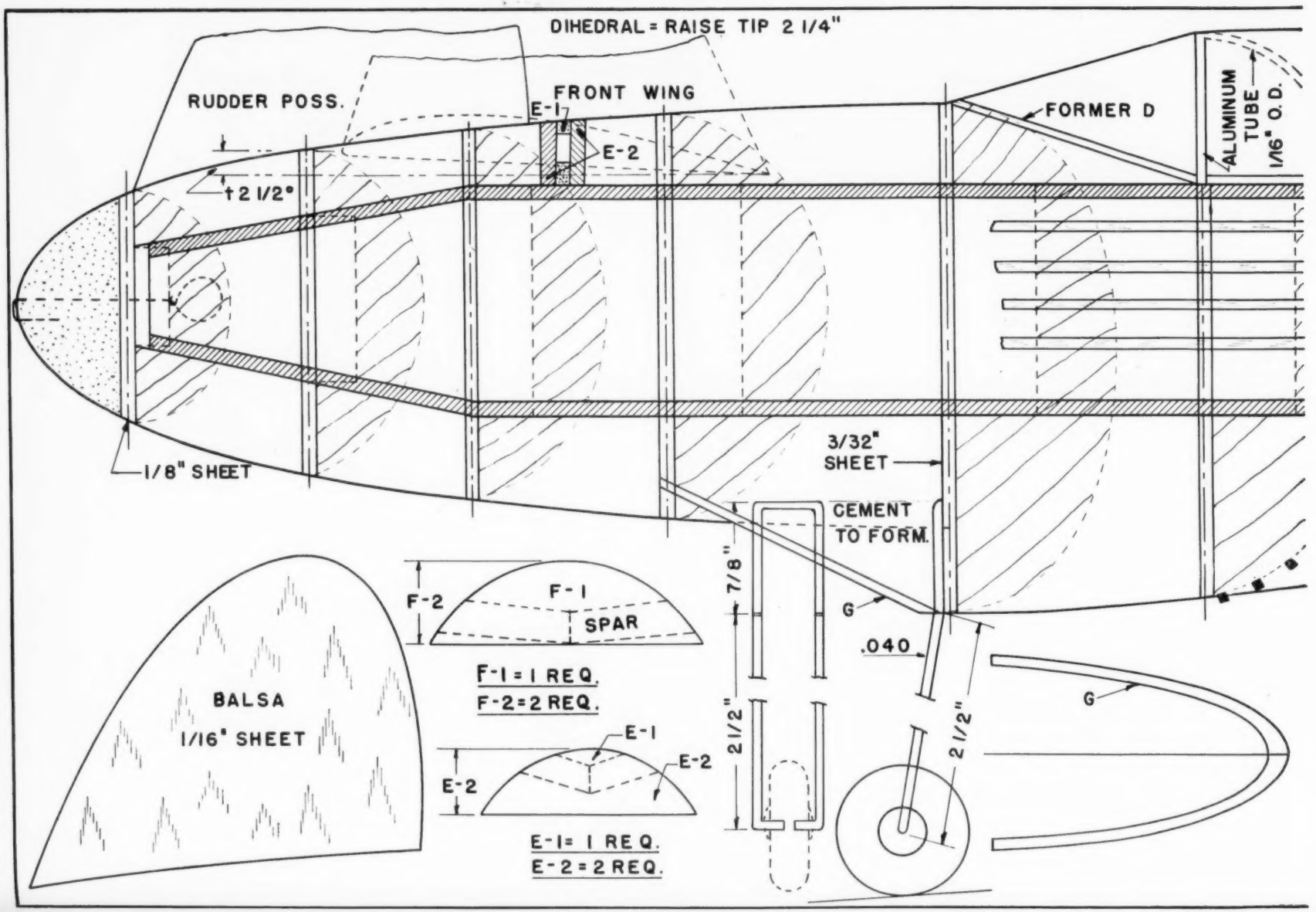
Another glaring error, from the pages of model building experience, are the vertical fins placed at the rear of the ship—without a fin at the nose. With these two large fins at the rear the ship cannot be controlled or steered directionally; or, at least, such control would be very unsatisfactory. To make a turn with this type of ship it is necessary to move one end in one direction or the other, to create directional displacement and thus enable the ship to turn. To move the end at which the propeller is located is practically impossible; it would not only destroy propeller efficiency but this end would be too close to the c.g. to move it effectively.

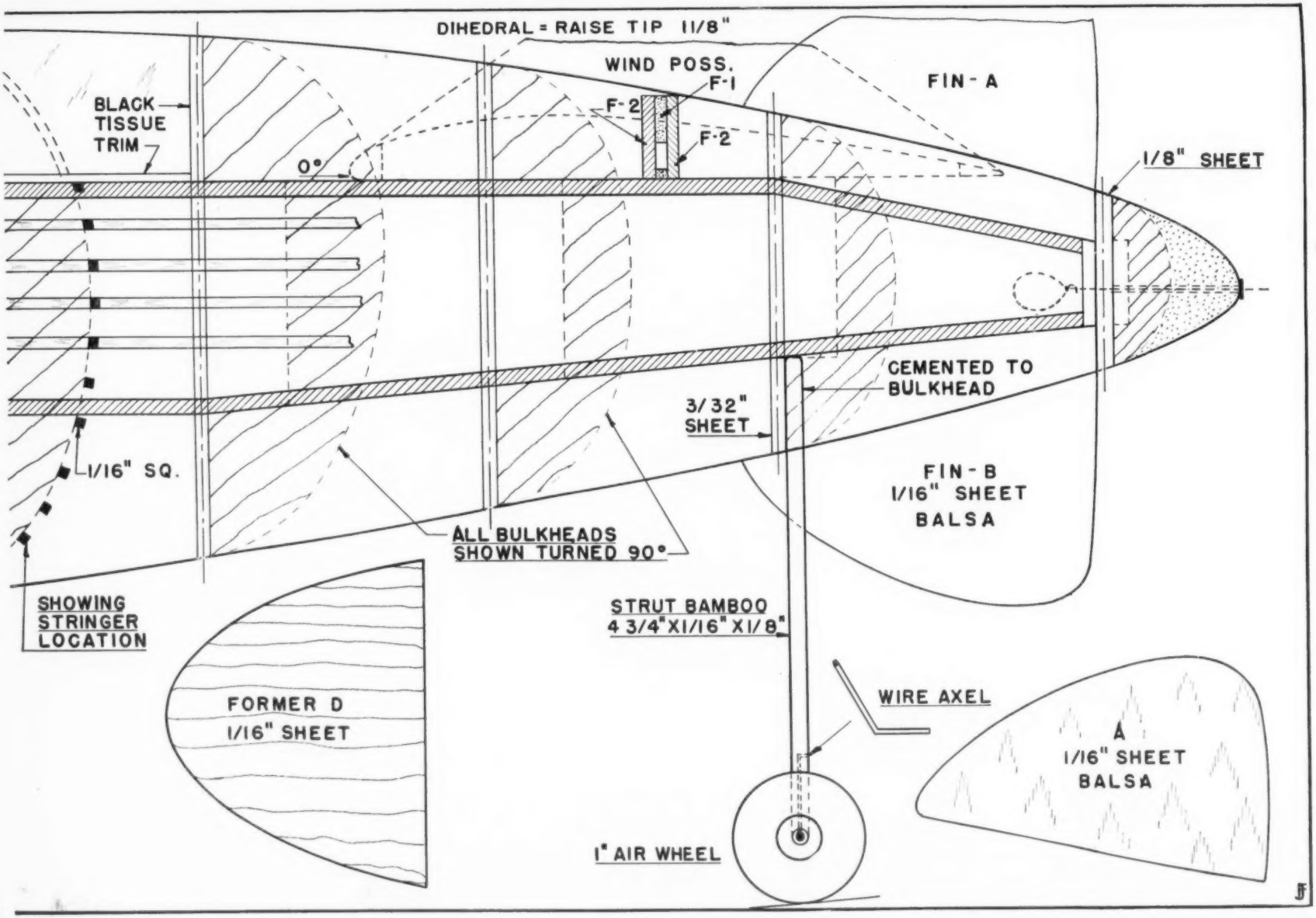
Therefore with canard type aircraft the rudder must be placed at the nose so as to push the nose one way or the other as desired. For steadiness it is essential to have a small amount of fin area at the rear. Best results probably would be obtained by having rudders at both front and rear. To make a right turn the front rudder would be *pointed* to the right, the rear to the left, thereby obtaining a double and effective action around the c.g.

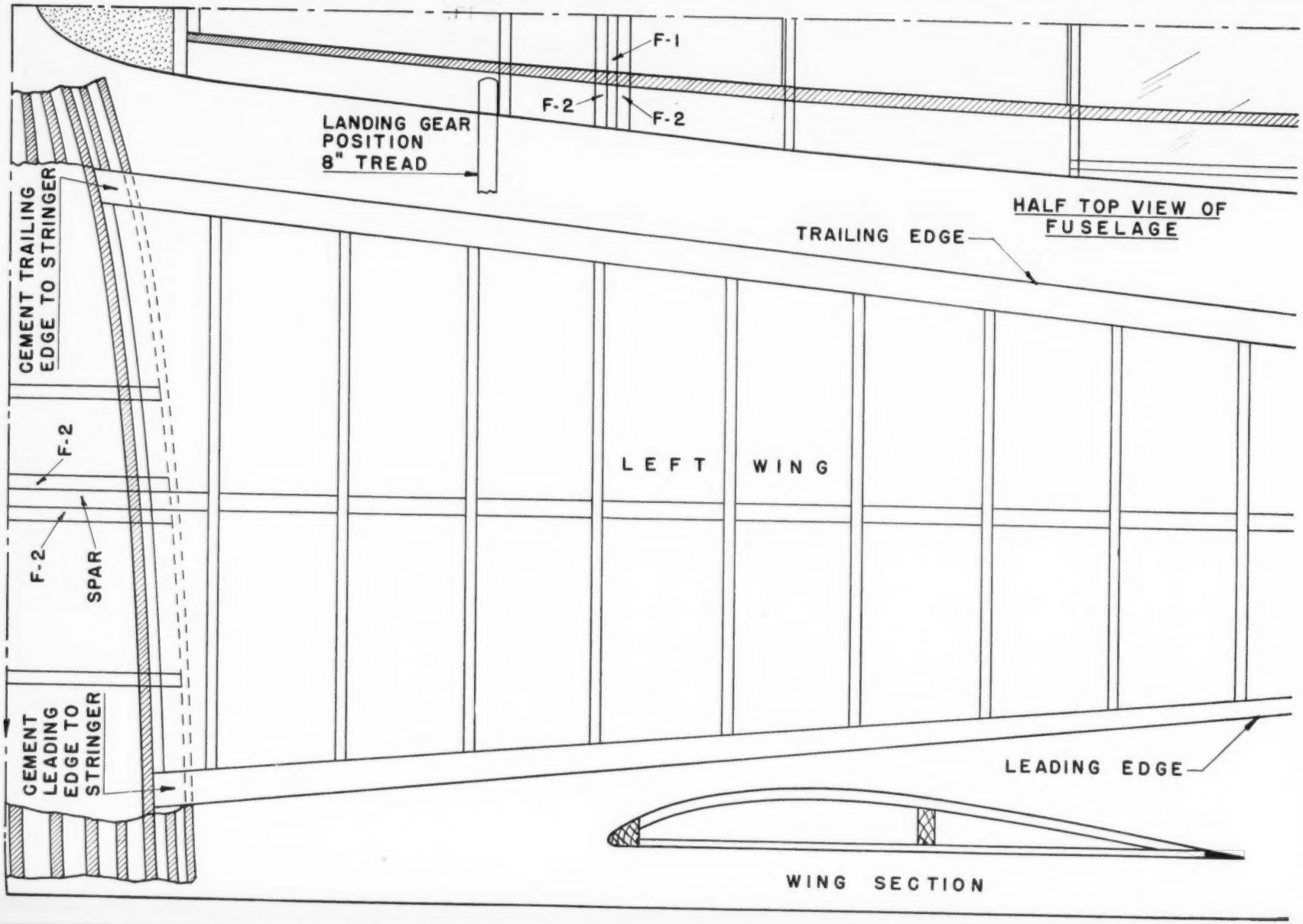
Though these modifications in design may seem trivial, around them hinge the success of this type of airplane. When properly designed such craft can be made excellent fliers; you will have a chance to prove this by building the model described in this article.

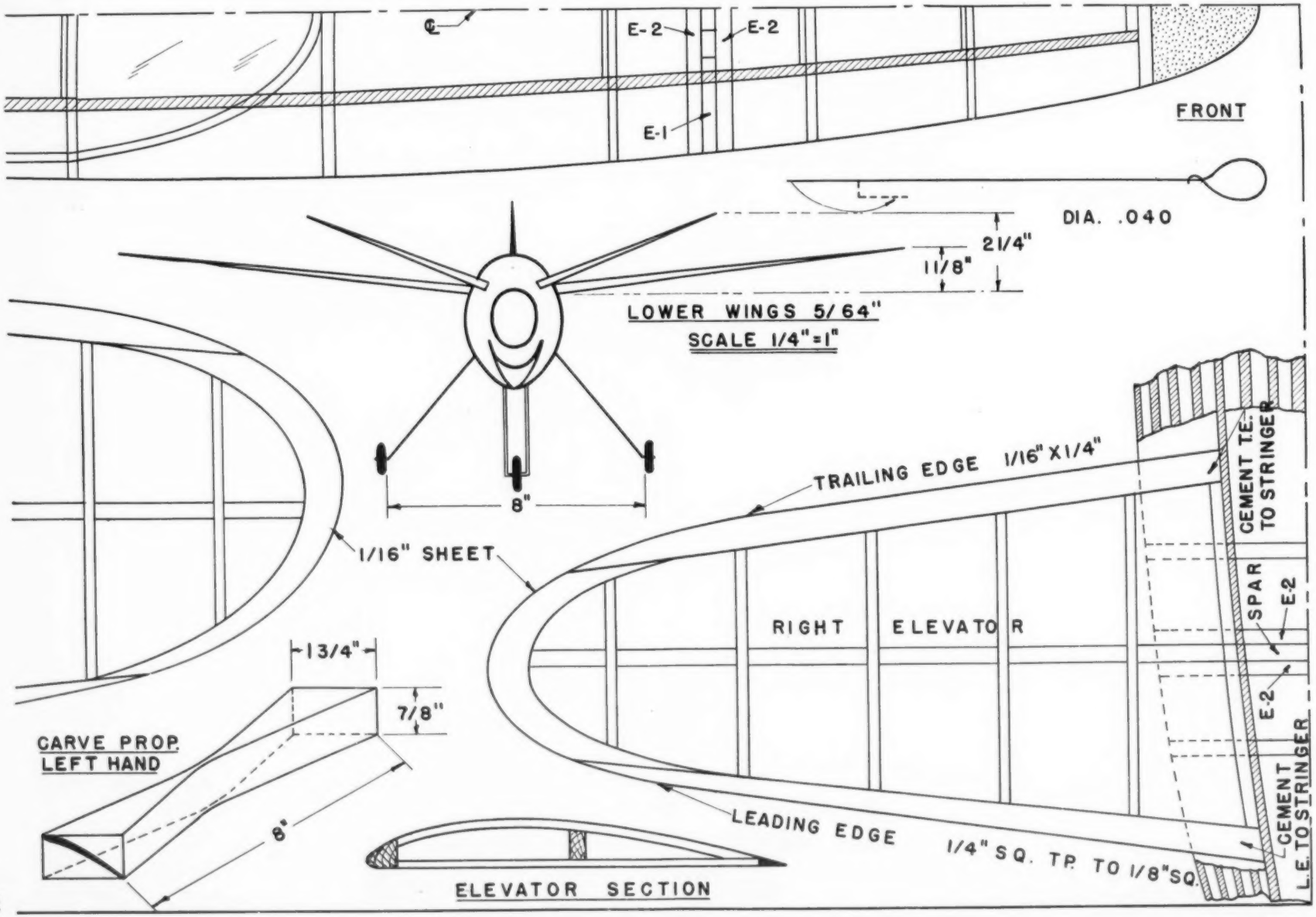
This model has been designed with the basic characteristics of the Army plane but in it have been incorporated essential changes for stable flight. You will note that: 1, the front wing has been given considerable dihedral; 2, its angle is 2-1/2 degrees greater than the wing angle, which is also essential; 3, the c.g. is well forward of

(Continued on page 38)


DIHEDRAL = RAISE TIP 2 1/4"
RUDDER POSS.
FRONT WING
E-1
E-2
FORMER D
ALUMINUM TUBE 1/16" O.D.
+2 1/2°
1/8" SHEET
3/32" SHEET
CEMENT TO FORM.
7/8"
G
.040
2 1/2"
2 1/2"
G
F-2
F-1
SPAR
F-1 = 1 REQ.
F-2 = 2 REQ.
BALSA
1/16" SHEET
E-1
E-2
E-2
E-1 = 1 REQ.
E-2 = 2 REQ.


DIHEDRAL = RAISE TIP 11/8"
WIND POSS.
F-1
F-2
F-2
FIN - A
BLACK TISSUE TRIM
0°
1/8" SHEET
CEMENTED TO BULKHEAD
3/32" SHEET
1/16" SQ.
FIN - B
1/16" SHEET
BALSA
ALL BULKHEADS SHOWN TURNED 90°
SHOWING STRINGER LOCATION
STRUT BAMBOO
4 3/4" X 1/16" X 1/8"
WIRE AXEL
FORMER D
1/16" SHEET
A
1/16" SHEET
BALSA
1" AIR WHEEL


F-1
F-2
F-2
LANDING GEAR POSITION 8" TREAD
HALF TOP VIEW OF FUSELAGE
TRAILING EDGE
CEMENT TRAILING EDGE TO STRINGER
F-2
F-2
SPAR
LEFT WING
CEMENT LEADING EDGE TO STRINGER
LEADING EDGE
WING SECTION


E-2
E-2
E-1
FRONT
DIA. .040
21/4"
11/8"
LOWER WINGS 5/64"
SCALE 1/4"=1"
8"
1/16" SHEET
TRAILING EDGE 1/16" X 1/4"
CEMENT T.E. TO STRINGER
SPAR
E-2
E-2
RIGHT ELEVATOR
13/4"
7/8"
CARVE PROP.
LEFT HAND
8"
LEADING EDGE 1/4" SQ. TP. TO 1/8" SQ.
CEMENT L.E. TO STRINGER
ELEVATOR SECTION

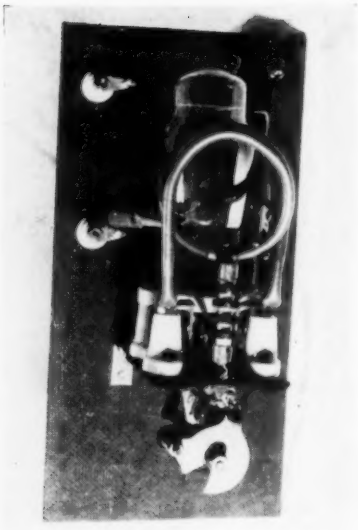
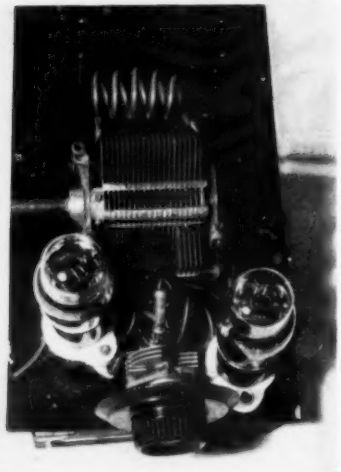
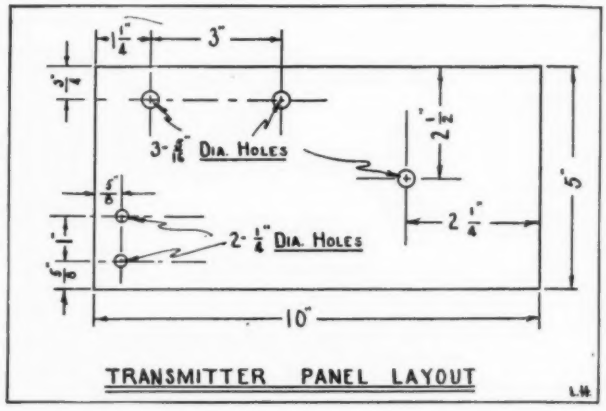


Fig. 1

Above, Fig. 2; below, Fig. 3



Left—top, Fig. 1, rear view of unity coupled transmitter; center, Fig. 2, front view of radio control transmitter; bottom, Fig. 3, atuned plate tuned grid oscillator. Right, Fig. 4



RADIO REMOTE CONTROL

How various types of radio control transmitters are built and operated

by **LEON HILLMAN**

A HALT has been called on all radio controlled model airplane flights! This is a result of the ban on the use of radio transmitters imposed upon licensed radio amateurs. A challenge has been offered to work under handicapped conditions. It is now the duty of every model airplane technician and radio amateur interested in radio remote control not to throw up his hands, but continue to experiment, study and train so as to contribute his knowledge for the war effort when called upon. Knowledge of radio is a necessity for pilots and aeronautical men and constitute part of the training given to our country's flying personnel.

There remains much work to be done: such as efficient and light mechanisms to operate control surfaces, motor speed control devices and numerous necessities for successful radio control. It is the purpose of this article to describe types and principles of operation of radio control transmitters and how they are built, that basic information concerning radio transmission will be part of the background of the growing specialized group of radio control technicians versed in aeronautics and radio.

Fundamentally a transmitter consists of: an oscillator to generate high frequency oscillation (in effect the radio signal), a power supply for the necessary current to operate the transmitter, and perhaps one or more radio frequency amplifier stages to strengthen the signal generated by the oscillator or change the oscillator frequency. An antenna is always necessary to radiate the generated radio signal. In transmitters for audio (sound) transmission and for some types of radio control apparatus based on the transmission of tone, a modulator is used to vary the radio signal in accordance with the audio signal to be transmitted. Since a model airplane radio control system requires easily portable and simple gear, the use of radio frequency amplifiers and modulators will be eliminated from the equipment design.

To select the type of transmitter circuit for radio control, several important accepted characteristics of different transmitter circuits must be analyzed. These considerations are: transmitter frequency, stability and power output.

Concerning operation wavelength of radio control transmitters there has been little dispute in acknowledging the use of ultra high frequency bands, usually the five meter amateur band. This is so because of the limited size of the parts that can be used in both receiver and transmitter, short antenna necessary for efficient operation, and minimum power necessary for coverage without interference, for model flights. Although fixed figures cannot be set for the power required for coverage—as so much depends on the local conditions such as height of antenna and surrounding terrain—nevertheless transmitter power necessary for ordinary coverage of model flights up to one-half mile, for reliable performance, should be at least two watts output. In some instances good results have been obtained with as little as one-quarter watt.

This assumes of course, in all cases, a reasonably sensitive receiver with efficient transmitting and receiving antennae. For successful coverage up to two miles, at least fifteen watts output power is desirable. Over two miles, to about ten miles, at least forty watts output power is required for consistent results. These figures have been obtained after extensive tests on the 56 megacycle (5 meter) amateur band with various transmitters and receivers at different altitudes using efficient antennae. The corresponding power input can be figured assuming the efficiency of transmitters at this frequency to be about sixty-five percent.

Frequency stability is the closeness to

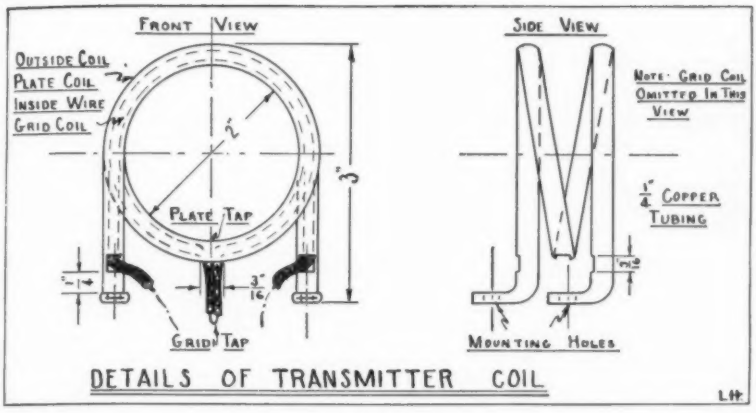


Fig. 5

which the transmitter adheres to its tuned frequency. In considering the frequency stability of the transmitter necessary, account should be taken of the stability of the receiver as well. Since radio control receivers usually tune very broad, it is a false notion to assume that an extremely high stable transmitter is necessary. However, highest possible stability without sacrifice should be attained, made possible by good mechanical design and circuit selection.

Of the basic types of transmitter oscillator circuits, most common are the Hartley, tuned-not-tuned, tuned-plate-tuned grid, electron coupled and crytal oscillator. The crystal oscillator—so named because it utilizes a specially ground quartz crystal as its frequency control—is highly stable but capable only of low output. Also, it cannot directly generate a 56 megacycle signal, and frequency multiplying stages are necessary. The other types of oscillators are known as self-excited oscillators. Of the self-excited type the electron-coupled is most stable but is a poor ultra-high frequency oscillator. The remaining types are capable of the greatest output, and although stability is not great the use of two tubes in the oscillator circuit to form what is known as a push-pull oscillator provides greatly improved stability.

The transmitter whose construction will be described is a type of Hartley oscillator in push-pull circuit. This combination provides the desirable power output and frequency stability. To further increase stability, a special type of coil is used to create unity coupling between the grid and plate circuit. For this reason this type of oscillator is usually referred to as "unity coupled oscillator." To eliminate use of two tubes and still provide a push-pull circuit, a tube type is selected that contains two tube elements constructed in one glass envelope. The result is a one-tube oscillator-transmitter providing power output of two tubes and stability of the push-pull unity coupled circuit.

Power output is determined by power input and the efficiency of the oscillator. Naturally, greater efficiency means greater output, hence every effort is made to limit losses. Power input is determined by the type of tube selected for oscillator circuit, and power may be supplied from either batteries, vibrapack, genemotor or alternating current-rectifier-filter power supply. The unity coupled oscillator can be operated with any of these power sources and can be changed from one to the other with only slight modifications in the oscillator. For example, the unit can be built for low power battery operation and later the power stepped up by changing the tube type and using a rectifier filter power supply.

Because of the few parts necessary the oscillator costs only a few dollars and is easy to build and wire; but in laying it out several points must be kept in mind. It is important that the length of all the leads (wires) be kept as short as possible, especially those of the grid and plate circuits. It is also desirable to arrange everything mechanical as symmetrically as possible. That is, if one grid lead is one inch long, the other grid lead should be one inch long. This becomes apparent when actually laying out the parts. A view of Fig. 1 shows a suitable arrangement of the components.

Bus bar wire (size No. 14) has been used for grid and plate connections to insure low resistance, mechanically solid leads. The panel is masonite; layout is shown in Fig. 4. Note in Fig. 2 that the tuning condenser is not mounted directly on the panel but on a separate bracket located some distance behind the panel. The shaft of the variable condenser is turned by an insulated shaft protruding through the panel and fastened to the shaft of the condenser by a shaft coupler. These precautions have been taken for a very important reason. If the hand comes too close to the condenser, while tuning or otherwise, the capacity of the body alters the tuning.

An amateur once started to tune his transmitter to a receiver in his model and everything worked fine until he removed his hand from the tuning dial. Then no response in the plane. He put his hand back on the dial and it worked. Not wanting to glue his hand to the dial he set the tuning dial a little off tune and when he removed his hand he hoped to be tuned in.

By merely using a shaft extension and moving back the tuning condenser this trouble is neatly avoided. Note also that if the condenser is mounted under the chassis directly below the coil the leads can be made very short.

The coil is a simple item to make if done properly. Secure a 16" length of 1/4" diameter copper tubing. Obtain a solid round object such as an iron pipe, bottle or can with an outside diameter of 2", to be used as a coil form for bending the tubing. Bend the copper tubing around this form and make a coil of one and one-half turns as shown in Fig. 5. At the exact center of the coil, at the bottom, file a small opening about 3/16" wide. Also file two small openings 3/16" wide on either side as shown in Fig. 5. Hammer the ends of the coil flat and drill a hole to allow the coil to be mounted on small stand-off insulators. Feed a good grade of insulated wire, like rubber or cambric covered wired, through one of the end openings, push it through the inside

(Continued on page 44)

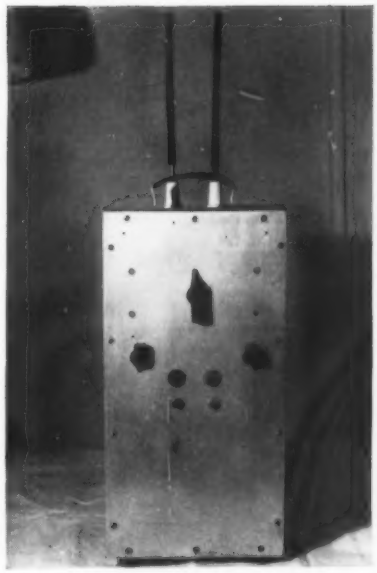
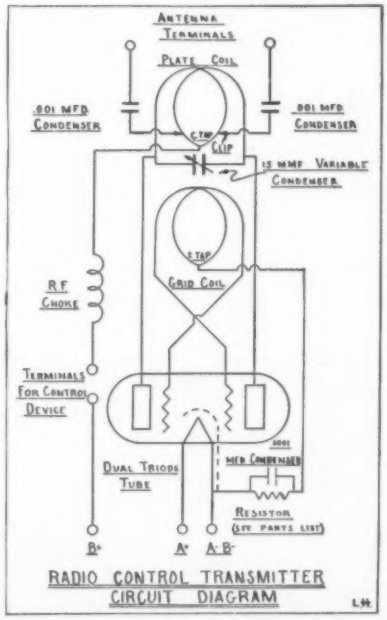
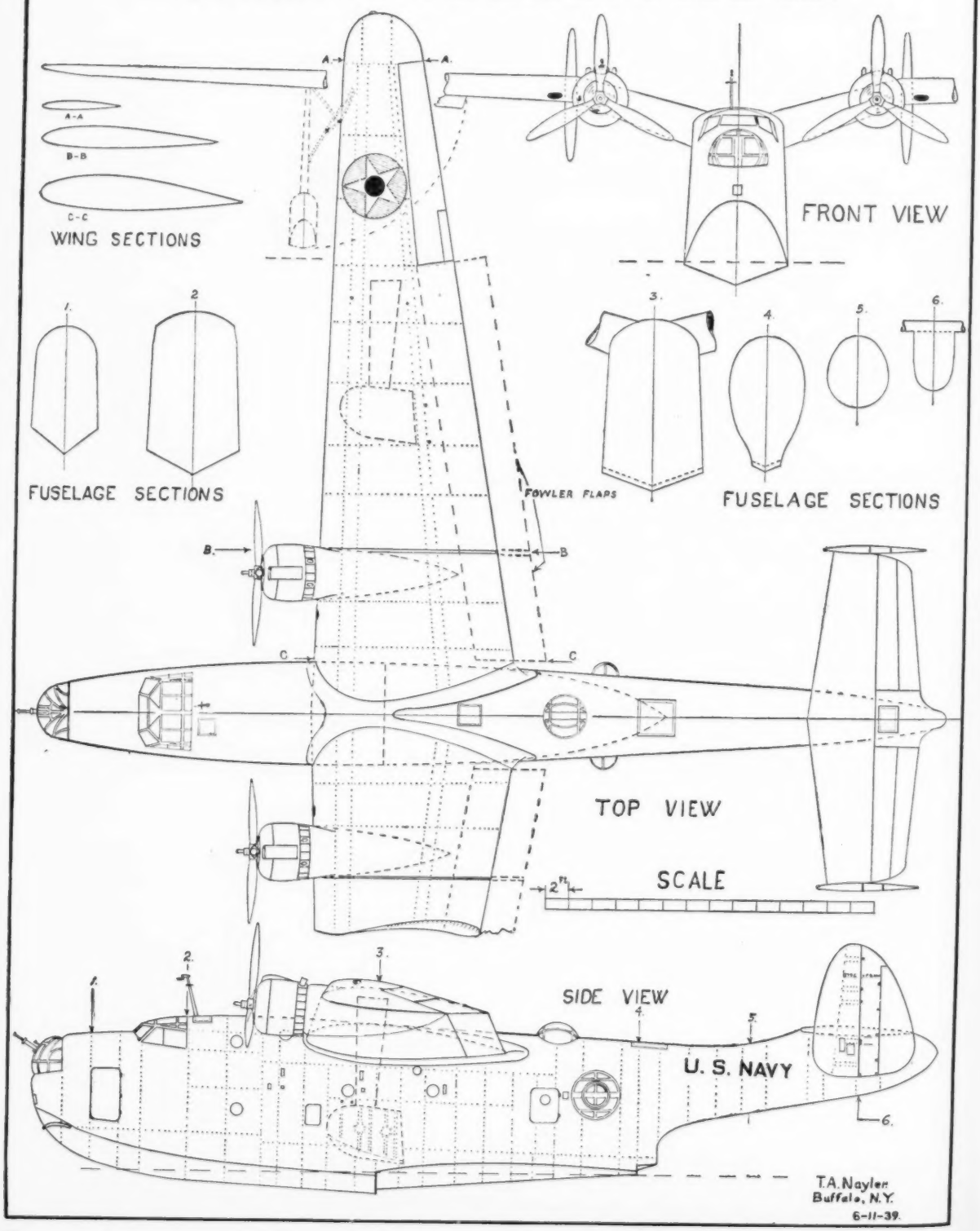


Fig. 6, a transceiver converted for radio control use

Fig. 7



U.S. NAVY PATROL BOMBER
"XPBM-1" MARTIN TYPE-162



AVIATION ADVISORY BOARD

Here are the answers to questions that puzzle you

MANY who build and fly model airplanes often become puzzled by the varied problems that present themselves. Model airplane designing, building and flying embody every known science and there is always something to learn.

Lately, many questions have come to us from all parts of the country requesting that we answer them in the pages of MODEL AIRPLANE NEWS. Consequently we take pleasure in giving these answers under the heading "Aviation Advisory Board," which will be a regular feature.

We have several pertinent questions from Mr. George Krueger, 2209 N.E. Klickita, Portland, Oregon—

Question: What are the advantages of a high thrust line; a low thrust line?

Answer: Each design factor in an airplane emphasizes some particular flight condition or action. The designer may emphasize one factor—that is, high thrust line—and obtain a certain type of flight; or he may lower the thrust line and obtain another type. What the designer desires, determines whether the thrust line be low or high.

High thrust line has been advocated for those who want stable flying planes under *all* flight conditions. That is, horizontal flight as well as climbing flight. Thus general flight capacity is obtained at the expense of the nosing-up couple, for the further the thrust line is below the line of resistance the more the plane will nose up under power or the farther back the c.g. may be located. This makes possible greater down thrust and greater stabilizer angle.

All these factors emphasize the buoyancy and climb of the model; so if a low thrust line is used the model will give these results. However these are obtained at the expense of stable horizontal flight, for in such a model the c.l.a. is usually above the c.g. and consequently is susceptible to spiral dives. In fact models of this type seldom fly horizontally without disturbing results; they are a one-type performance airplane, namely, climbing, and should be used solely for contests.

If the thrust line is high the nosing-up moment due to power, the angle of the stabilizer, and amount of down thrust is less. Such a ship must climb on the propeller rather than by the effect of the wings and stabilizers.

However it will climb well and also fly horizontally with perfect stability. Any airplane, built with reasonable proportions and structurally capable of flight, is able to fly in some particular way. The proportions of design emphasize the type of flight for which it is best suited.

Question: Where is the best location for the c.l.a. with respect to the c.g. on a gas model using a pod and tail boom, instead of the conventional fuselage?

Answer: Here again is the question of type of flight desired. For climb only the c.l.a. may be high. However if stable flight is desired under various conditions the c.l.a. should be approximately on a horizontal with the c.g., accomplished by giving the model down thrust because the horizontal is measured relative to the thrust line.

With down thrust, the thrust line is horizontal, the tail is dropped and consequently the c.l.a., resulting usually in the c.l.a. being lowered to a point on a level with the c.g.

Question: What are the advantages and disadvantages of low c.l.a.?

Answer: A high c.l.a. induces quick recovery at the top of steep climbs but causes spiral dives in horizontal flight.

There are many advantages to low c.l.a. Low c.l.a. models spiral climb steeply, or rather corkscrew climb, for usually the underside of the wing faces the axis of the spiral; while when the c.l.a. is high the top of the wing faces the axis. Low c.l.a. gives the model spiral stability in horizontal flight, making it less susceptible to wind gusts.

Question: What are the correct proportions for a combination rudder-stabilizer?

Answer: The stabilizer should be "veed" so each half is 30° to the horizontal. The stabilizer's total projected area should be increased approximately 15%; measured in the plane of the stabilizer it will be about 30% larger. This extra area allows the stabilizer to retain sufficient horizontal or lifting component and side or lateral component; functioning satisfactorily as both fin and stabilizer.

VICTORY

ONLY THE UNINFORMED CALL THEM "TOYS"

Says THE INSTRUCTOR

WE FIGURED this fellow had been shooting his mouth off long enough, so we interrupted him. He had been going on and on about model aviation being nothing more than a kid's game and of no practical value to aviation.

Now, you know and the Instructor knows that is just so much bosh. Probably no single activity contributes so much to aviation as does this hobby-sport of building and flying model aircraft. We can understand how hard it is for someone who has never seen a model airplane to appreciate the practical training such work provides for a career in aviation. But once a person has had an opportunity to witness a large contest or watch some model builders at their work benches, we just can't stand by passively and listen to them decry model aviation and deprecate the efforts of the aeromodelers.

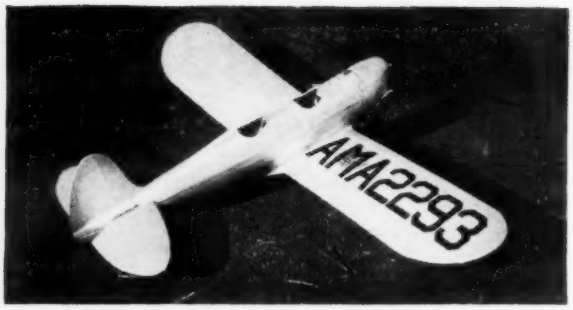
"Listen," we told this unbeliever, "here's a little story on just one club of model builders which will prove you are all wet and that model aviation contributes materially to full-scale aviation."

Here's what we had to say: "Once upon a time there was a club of model airplane builders in a large East Coast city. These modelers had a great deal of fun building and flying models. They participated in contests which were held every two weeks—indoors during the winter season and outdoors during the summer season.

Now, none of these modelers thought much about aviation or expected that they would become aero-technicians or aviators. In many ways, however, these young fellows demonstrated that they had an excellent grasp of the basic principles of aerodynamics and that they were up to date on the latest events in the world of aviation At club meetings, this group would confound the aviation instructors and skilled pilots who came in occasionally to speak to them. In no effort to show off, but because they were extremely interested in aerodynamics, these modelers would pop questions at their well-known speakers which would leave these august gentlemen floundering around in an effort to keep up with the youngsters.

Now, a few years later, we check up on this group of model airplane builders who thought they were not particularly interested in senior aviation and find that one is in the navy attending aerological school at the Naval Air Station in Lakehurst, New Jersey; another is associated with the country's largest private aviation organization; another has just received his aeronautical engineering degree this past summer; another is a junior engineer with the National Advisory Committee for Aeronautics conducting flight research at Langley Field, Virginia; another is in charge of a research department at the Vought-Sikorsky Aircraft plant at East Hartford, Conn.; another is in the engineering department at this same plant; and two others have been working at Lockheed on the West Coast for several years."

(Continued on page 44)

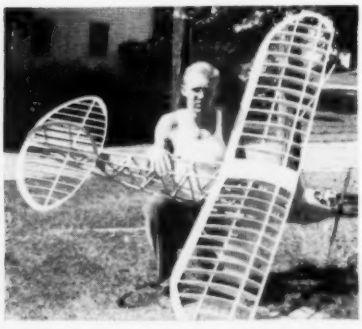


1. A gas powered scale Ryan Trainer that was originally rubber powered. (Right) 2. Bob Davis' fine flying ship with detachable motor unit, timer, wing and tail

3. Austin Rinaldi's tandem glider that turns in fine flights

4. A famous Russian model flier with an efficient rubber power "hydro"

5. Harold Alexander with one wheeler; note the fine wing and stabilizer structure. (Below) 6. Bob Hansen with his uncovered "Power House"; its structure is clearly visible



AIR WAYS

News of models, builders and activities from all parts of the world

—

Model Airplane Engineer News

ABOUT nine years ago Gordon Murray of Brooklyn, New York, started building model airplanes. He slept, ate and lived aviation, finding vent for his mechanical genius and initiative in the creation of all types of model flying craft. In a short time his skill placed him among the leaders and winners of sectional and national contests.

Success made no change in "Scotty" except to increase his determination and make him more serious in his work. Most model builders knew him as a quiet unassuming person; he seldom spoke, but when he did back of it was real purpose. He was among those who preferred to translate his mind and emotion into action rather than talk. And so in his years of participation in model aviation he gained a host of friends.

In 1935 he made a name for himself in the model field, from then on he developed hundreds of craft in all classes—ranging from gliders to large gas jobs. His ships flew remarkably well and the walls of his workshop were covered with trophies, cups, medals and other awards. He placed in the 1939 and 1940 Nationals in gas classes and in 1939 was a proxy flier at the International Wakefield Meet held in Bendix, N.J. An excellent draftsman, he made drawings of his own ships and also drew plans for several other designers.

During this period of model designing, building and flying Scotty developed a broad and basic understanding of aviation principles and continued his active participation in all model events until the war. It was excellent preparation for the job he finally undertook, for in November 1940 he entered the Royal Canadian Flying Force.

His last trip home was in August 1941, when he sported the wings of a Flying Sergeant and at this time he stopped in to see your editor. Scotty certainly made a fine picture in his natty blue uniform! As usual he was quiet and soft-spoken, but one could feel his determination and spirit. Shortly after this final visit he was sent to England.

He spent part of the year in a northern Scottish base where he became the ace pilot of the Edinburgh Spitfires. Details of his accomplishments are lacking, but evidently Scotty paved his road with glory, for he was awarded the Distinguished Flying Cross. Finally he was assigned to Malta, arriving there on April 21st.

On the morning of April 22nd he went into action against an attack of German bombers and shot down four. The same afternoon he went into action again—but this was to be Scotty's last flight. Against insuperable odds he fought the gallant fight —and went down in shining glory. For this final exploit he was awarded posthumously the Victoria Cross—England's highest military award.

His death will be a shock to all who knew him, but his courage and determination will be an inspiration to every model builder in America. The boy who reveled in the exploits of Guynemer and Rickenbacker now stands shoulder to shoulder with them, cloaked in immortal glory.

Pilot Officer Gordon Murray — V.C., D.S.C.: America and world modelers salute you!

Model Airplane Engineers has just been organized and a number already have enrolled. They are as follows:

Honorary First Member, the late Gordon Murray, V.C., D.S.C.; PFC Frank Osborne, U.S. Army Air Corps, Stockton, Cal.; William A. Fleming, 344 Penn. Ave., Glen Ellyn, Ill.; Virgin Gin, 705 Chillicothe St., Porthsmouth, Ohio; Curtiss Ladd, 5401 Morello Rd., Baltimore, Md.; Edward S. Ciaszki, 10 Linden Place, Danbury, Conn.; Warren Morris, 400 Victoria, Kenmore, N.Y.

Other enrollments are arriving in ever-increasing numbers. We suggest those who do not know about this new organization read "Air Ways" in the June issue, where details concerning it are given. News of its members will be published each month, not only personal items but comments and activities, models, etc. As the organization develops it is expected that pins and cards will be available, about which more will appear later.

Those who want to join should write in

7. A 103 mph U-control model and its pilot, Sherman Schultz

to Model Airplane Engineers, MODEL AIRPLANE NEWS, 551 Fifth Avenue, New York City.

A few interesting pictures of builders and planes have come to us, that deserve comment. In picture W. A. Manes of the New York area is shown test gliding his class C gas job, a modified version of Henry Struck's "New Ruler." Two interesting features are incorporated in its structure; first, wing tip slots that prevent the ship from stalling suddenly and has the effect of rounding off the top of the lift curve. At steep angles the center of the wing would stall if the slots in the tip did not continue to lift for a number of degrees past the normal stalling point. This prevents a sudden drop in the lift, allowing it to dive gradually.

Second, on the upper surface of the wing near its center are "spoilers" or small flaps running parallel with the wing spars. In normal flight they lie flat against the upper surface, but a timer pulls them upward, destroying lift over a large part of the wing during the glide. This steepens the glide and prevents loss through thermals.

This reveals the latitude of opinion among model builders—some work day and night to increase efficiency and soaring ability and other decrease it. Which is right?—individual preference!

Jack Moralez of 1118 Q Street, Lincoln, Nebr., sends us picture 1 of a very interesting scale Ryan Trainer, rubber powered, that he converted into a gas model. This is interesting in light of the rubber shortage, for apparently now it is easier to obtain gas motors than rubber. So, if you readers have large rubber powered ships hanging around the workshop and inactive for the sake of a good rubber motor, we suggest you get busy converting it to a gas model. It is not really very difficult and provides an interesting design and construction problem—one that helps work loose a bit of "rust" from mental cogwheels.

W. J. Steinbock of 4246 N. Keller Ave., Chicago, Ill., with his tether-flight model of original design (picture 12), examination of which will disclose unique features. Note that the fuselage is constructed in two halves, from nose to tail, and is racy looking. It has a wingspread of 39" and is 29" long, powered by an inverted Forster 29 that gave an estimated 70 mph. in many consistently smooth flights. A Davis wing section, Steinbock says, accounts for its extremely slow landing speed.

Picture 11 shows a unique modification to the stabilizer of a class C gas job, de-

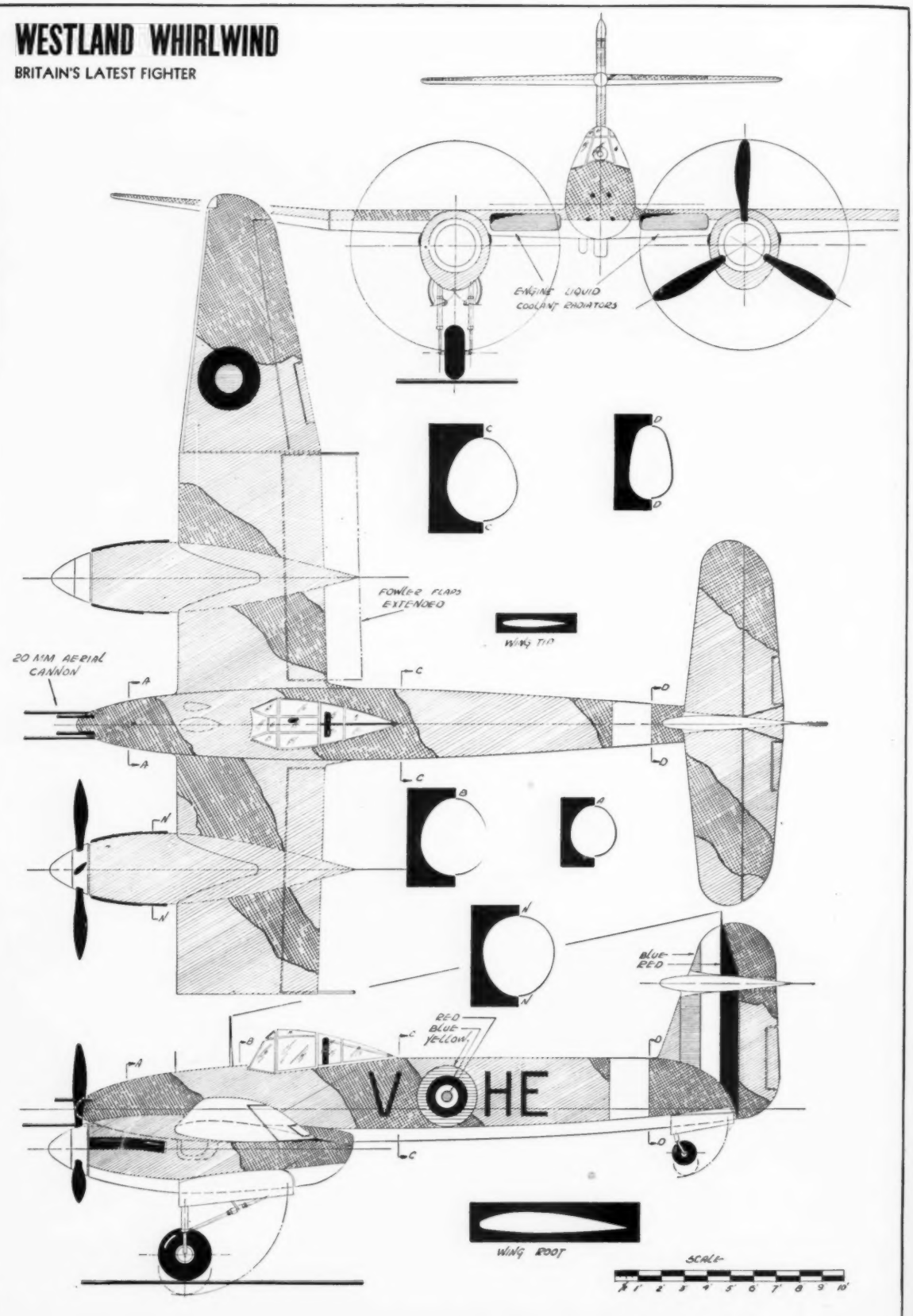
(Continued on page 54)

8. W. A. Manes prepares to test glide his slotted wing gas job; it has spoilers on the wing that operate to reduce the glide

(Above, left) 9. Expert modeler Yolanda Di Nicola with one of her fine gas jobs. (Right) 10. Pilot Officer Gordon Murray, DSC, VC, while training in Canada. (Below, left) 11. Nick Skuce and his gas job with an auxiliary stabilizer that increases the glide. (Right) 12. W. J. Steinbock with his 70 mph tether model of original design

WESTLAND WHIRLWIND

BRITAIN'S LATEST FIGHTER



Fuselage is made as small as possible to reduce unnecessary weight and drag

WESTLAND WHIRLWIND

The plane on the cover

NO NEWCOMER to the field is the Westland firm manufacturer of the sleek fighter shown blazing across our cover this month: the Westland Whirlwind. Back in 1915 Westland aircraft were building—and in the bloody spring of 1918 the famed Westland "Wagtail" fighter was carrying its share of the load over the Western Front. Through the experimental 'twenties and the perfection 'thirties Westland aircraft continued to bring new methods and designs to the Royal Air Force; and now the production 'forties have brought a new Westland, this time a culmination of over a quarter-century of aircraft design.

The Westland Whirlwind was not built as a breath-taking "hush-hush" superfighter, but rather a high-performance interceptor capable of catching the enemy and destroying him, yet capable also of being turned out in huge quantities to meet the aerial armadas of the Luftwaffe which are a constant menace for tomorrow.

The Whirlwind is unconventional in several respects, although the production of a twin-engine single-seat fighter is not new either in this country or abroad. The high placement of the horizontal tail surfaces, so designed to prevent buffeting caused by interference with the main plane, is the most unique feature of this new fighter together with its long, oval fuselage.

Westland Whirlwind is a twin engine high speed fighter of unique design; note the stabilizer placed high on fin above the turbulent air back of the wing

Construction is metal throughout with the exception of fabric covered control surfaces. The wing is built in four sections with two tip sections. The main inner panels are joined at the fuselage with the two spars continuing through. The outer panels attach just outboard of the engine nacelles through bolt angles. The structure consists of the two spars assemblies connected by pressed flange ribs and chordwise false ribs or stiffeners, span-wise stiffeners and flush riveted skin plating. The wing is built in three sections (longitudinally), the main section being made up of the two spars forming a box beam, the nose section, and the trailing section. The nose section of the outer panels carry the automatic slots and the inner section carries the duct openings leading to the radiators. The trailing sections of the outer panels carry the ailerons and the inner panels carry the flap tracks and control mechanism.

The flaps are of the patented Fowler type (most popular in this country aboard the Lockheed "Hudson" and "Ventura" bombers) utilizing a curved airfoil section mounted on tracks which roll through each other out and down, giving a considerable increase in total wing area in the down position.

Two large flap panels are used, one on each inner wing panel; and the chief advantage of the type is that in addition to the tremendous drag created, additional area compensates for the loss of lift, thus giving adequate control at slow speeds. The typical outrigger track supports peculiar to the type are mounted aft of each wing inner section. A unique feature of this installation aboard the Whirlwind is the hinging of the entire trailing section of the engine nacelles aft and down in unison with the flap panels.

The fuselage is of constant crossection throughout its length with the exception of deep tapers at front and rear ends. The nose of the fuselage tapers to a sharp point and carries the armament. The pilot is located atop the fuselage in a light sliding hatch enclosure which is completely removable in emergency. The headrest is of heat-treated chrome-molybdenum steel and

(Continued on page 45)

ACADEMY OF MODEL AERONAUTICS

Official Model Airplane News

Prepared by **ALBERT L. LEWIS,** *Director*

Contest Board Issues Wartime Regulations

THE Contest Board of the Academy of Model Aeronautics, through its chairman, Everett N. Angus, has released the wartime competition regulations governing model aviation in America.

The rules, while calling for minor changes in flight procedure, make no immediate change in classifications—thus permitting all craft flown under the 1942 regulations to be eligible for competition.

In announcing the regulations, Chairman Angus expressed the appreciation of the Contest Board to all individuals who participated in the difficult task of formulating wartime rules which would permit aeromodeling to continue, yet keep it from interfering with the accelerated full-scale aviation activities.

High Lights of Wartime Contest Rules

Stick models are permitted to have crossectional area up to $L^3/150$, instead of the previous limit of $L^3/200$.

Gas powered models are not required to have any minimum or maximum fuselage crossectional area. This is to encourage more original design and is in accordance with modern aircraft design, which is deviating from the old established methods of large fuselages.

In instances where lack of, or insufficient, runways do not permit unassisted takeoffs for outdoor models, the contestant is permitted to guide his or her model to assist in any manner its flight start. Mechanical assistance at takeoff such as catapults or other methods are permitted as long as the "assistance" is a part of the model.

All gas models will continue for the present under the existing weight regulation of 80 ounces for every cubic inch of engine(s) displacement, and 8 ounces for every square foot of projected wing area.

The weight regulation on outdoor autogiro, ornithopter and helicopter has been changed to the requirement that such craft shall weigh not less than one ounce.

The large class D category for indoor hand-launched stick models has been dropped and this event will open to class B and C models only, as in previous years.

Maximum motor runs for gas models have been shortened to 15 seconds.

Gas models are limited to recorded flights of not more than 4 minutes. If a flight is between 4 and 6 minutes, the time in excess of 4 minutes will be deducted from 4 minutes; flights over 6 minutes will be *voided official flights.* This works out so that a flight of 5 minutes would be recorded as a 3-minute official flight. A flight of 4 minutes, 20 seconds, would be recorded as 3 minutes, 40 seconds.

The scoring of gas models shall be the total of the official flights—1, 2, or 3.

The minimum length of official flight time for outdoor rubber and glider models has been raised from 20 seconds to 40 seconds.

The scoring for outdoor gliders and rubber powered models shall be the longest official flight instead of the average of the official flights.

In outdoor events, other than flying scale and radio controlled, the contestant is permitted only one model.

No perpetual records in gas model events may be established for the duration of the war. The Academy will issue merit certificates to licensed fliers making the highest national marks under the limited flight arrangement.

Rubber powered stick models may not be flown in fuselage events, and vice versa.

The wartime regulations are now being prepared for distribution by the Academy and it is expected that the flying regulations and the rules for flying indoor and outdoor flying scale models will be available from A.M.A. headquarters in about two weeks for approximately 25c.

Added Facilities for the A.M.A.

Although assurance was given to A.M.A. Leader Members sometime ago in *Model Aviation* that the transfer of Air Youth of America to the National Aeronautic Association would not result in any loss of activity to the Academy, some fears have been expressed that the Academy is either no more or "is on its way out".

This is not the case at all.

Functioning as the Technical Section of the N.A.A. Air Youth Division, the Academy is now able to secure more headquarters' help and its importance in the national aeromodeling picture has been increased. More people are learning of A.M.A. activities and more clubs are affiliating each week. Despite wartime conditions, a number of competitions have been sanctioned by the Academy, as will be noted elsewhere in this issue.

All meets are being sanctioned in the name of the Academy and no expert meets will be approved in the name of Air Youth or any other agency associated with N.A.A. The last year's practice of designating certain Academy-sanctioned meets as Air Youth State Meets has been dropped and, instead, Academy-sanctioned affairs will be eligible for a series of awards which have been made possible through the generosity of the Model Industry Association.

Information on these awards, which will be available for presentation in approved meets, will be sent to Contest Directors as soon as the awards are on hand. Meet directors are requested not to write headquarters regarding these prizes; full information will be mailed the moment they are available.

Army Seeks Large Number of Model Planes

As the Navy's scale model program to secure half a million authentic copies of military aircraft taking part in World War II moved into high gear, the Army announced that it, too, will need large quantities of models. Under special contracts let by the Army Air Forces, miniature warships as well as warplanes are being constructed "by the thousands." With these models, built to a scale of one inch to six feet, high altitude bombardiers and other crew men will learn at training schools how to establish immediate identification of any nation's warships and warplanes. Models being constructed include ships and planes of the British, Australians, Germans, Italians, Japanese, as well as those of the United States.

National Meet Finally Set for July 21-25

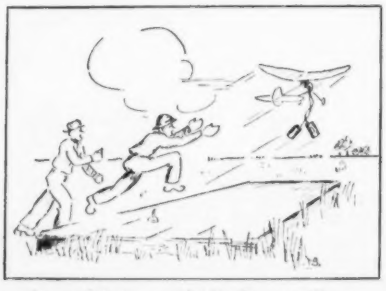
After the third change, the dates for the Fifteenth National Model Airplane Championships to be held in Chicago have been fixed for July 21-25.

Originally the meet was announced for the end of July and the first days of August, but later was shifted to August 4-8. Wartime conditions and "defense" conventions in the Chicago area made it necessary to shift back to a somewhat earlier date, the fourth week in July.

Modelers are looking forward to seeing each other July 21, 22, 23, 24, and 25.

And you can take that as final!

VICTORY



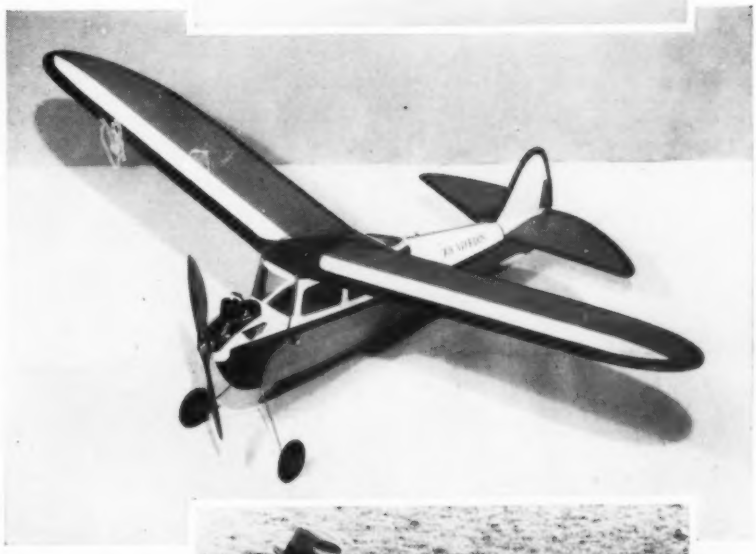
Forgetful Gus and His Booster Bus

That Record Heave—or—Has Anyone Got Any Glue?

THE FLYING AIR WARDEN

A high performance contest "C" gas model that looks like a real airplane

by **AL PARDOCCHI**



FOREWORD

Al Pardocchi has produced some of the finest and most consistent planes ever built. Therefore, when he told us he had completed a new ship we expected to see an outstanding job—we were not disappointed. The Air Warden is not only pleasing to the eye but sensational in flight. Despite the fact that the motor did not deliver maximum power by any means, the ship turned in four consecutive 6 minute flights on 12 second motor runs. They were *not* thermal flights . . . the Air Warden simply attained such altitude in those 12 seconds, and the glide was of such excellence, that the ship "hung" up there. Modelers will not make any mistake in building the Air Warden; it's one of the most efficient performers we have ever seen and at the same time it *looks like an airplane.*

Carroll Moon,
Senior Director, The Sky-Scrapers.

One of those rare ships having both good looks and fine performance. (Top) Gliding in after a trip to the clouds. (Right) Al tunes 'er up for a short flight of 6 minutes.

THE Air Warden was particularly busy on the Sunday that club director Mr. Moon came out to see it fly. A few hours before he arrived a flight had been made with a 17 second motor run. Shortly after the takeoff the ship hit for the clouds, climbing steeply in a wide left circle under power.

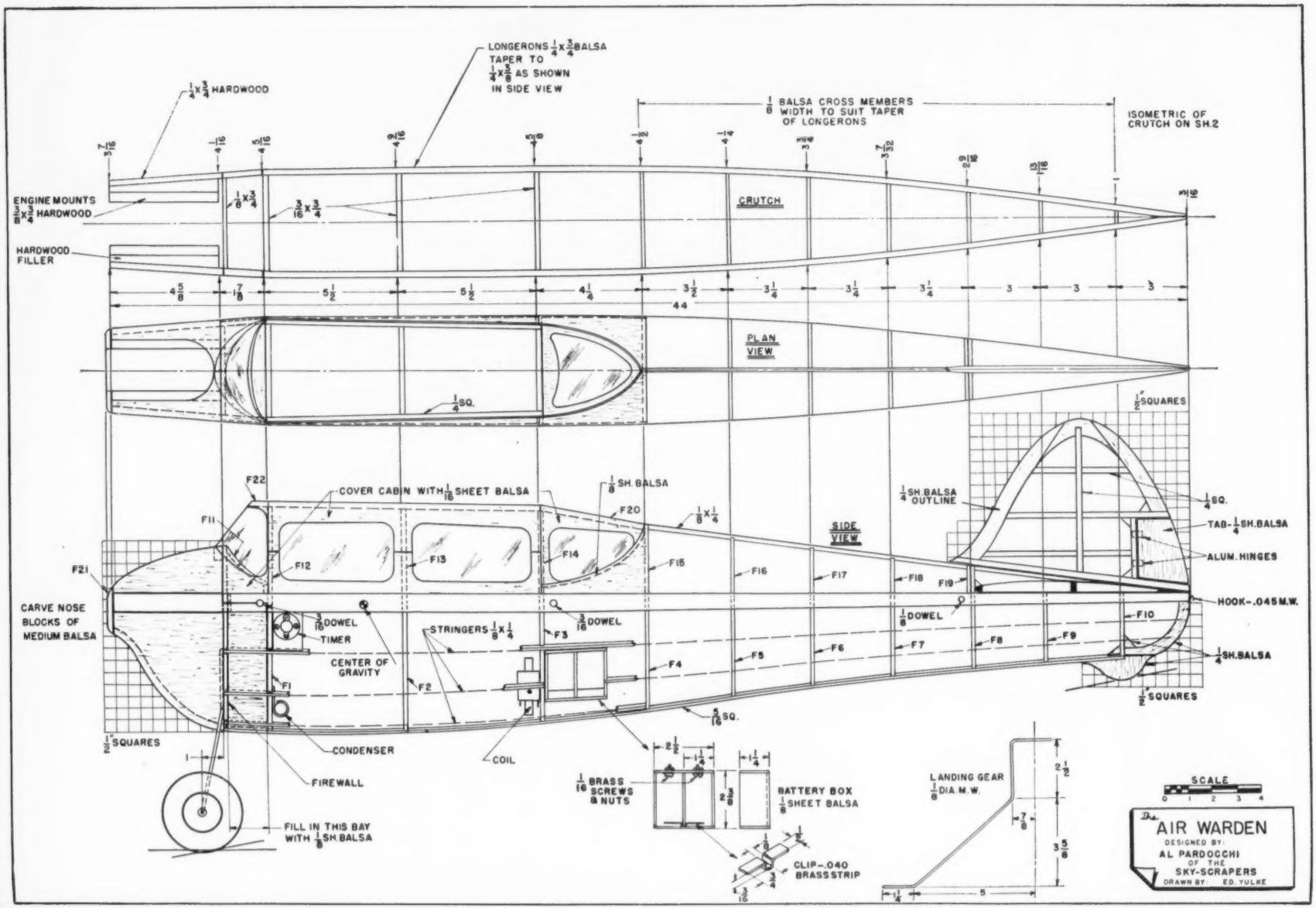
It seemed as though the motor would never cut; but finally the ship began a telltale lazy circle to the left. Far above the other ships it seemed to hang in mid-air while a slight wind carried it down the field. Apparently it was headed for the "last resting place of lost models," so we piled into the car and began the chase. After a wild 10-mile ride the ship was recovered and upon returning to the field we learned it had been in sight 32 minutes. Many other flights like this have been made since.

So here we proudly present a real contest ship that doesn't look like the dream of a madman. Due to fine aerodynamic design, similar to the "Meteor" appearing in the September issue of MODEL AIRPLANE NEWS, it gets the results that all modelers want—*real* performance.

CONSTRUCTION — Despite the fine curves, the sleek fuselage and general contour, the Air Warden is not difficult to build.

First make a full scale layout of the plane

(Continued on page 50)


LONGERONS 1/4 X 3/4 BALSA TAPER TO 1/4 X 3/8 AS SHOWN IN SIDE VIEW
1/4 X 3/4 HARDWOOD
1/8 BALSA CROSS MEMBERS WIDTH TO SUIT TAPER OF LONGERONS
ISOMETRIC OF CRUTCH ON SH.2
ENGINE MOUNTS 3/8 X 3/4 HARDWOOD
1/8 X 3/4
3/16 X 3/4
CRUTCH
HARDWOOD FILLER
4 5/8
1 7/8
5 1/2
5 1/2
4 1/4
3 1/2
3 1/4
3 1/4
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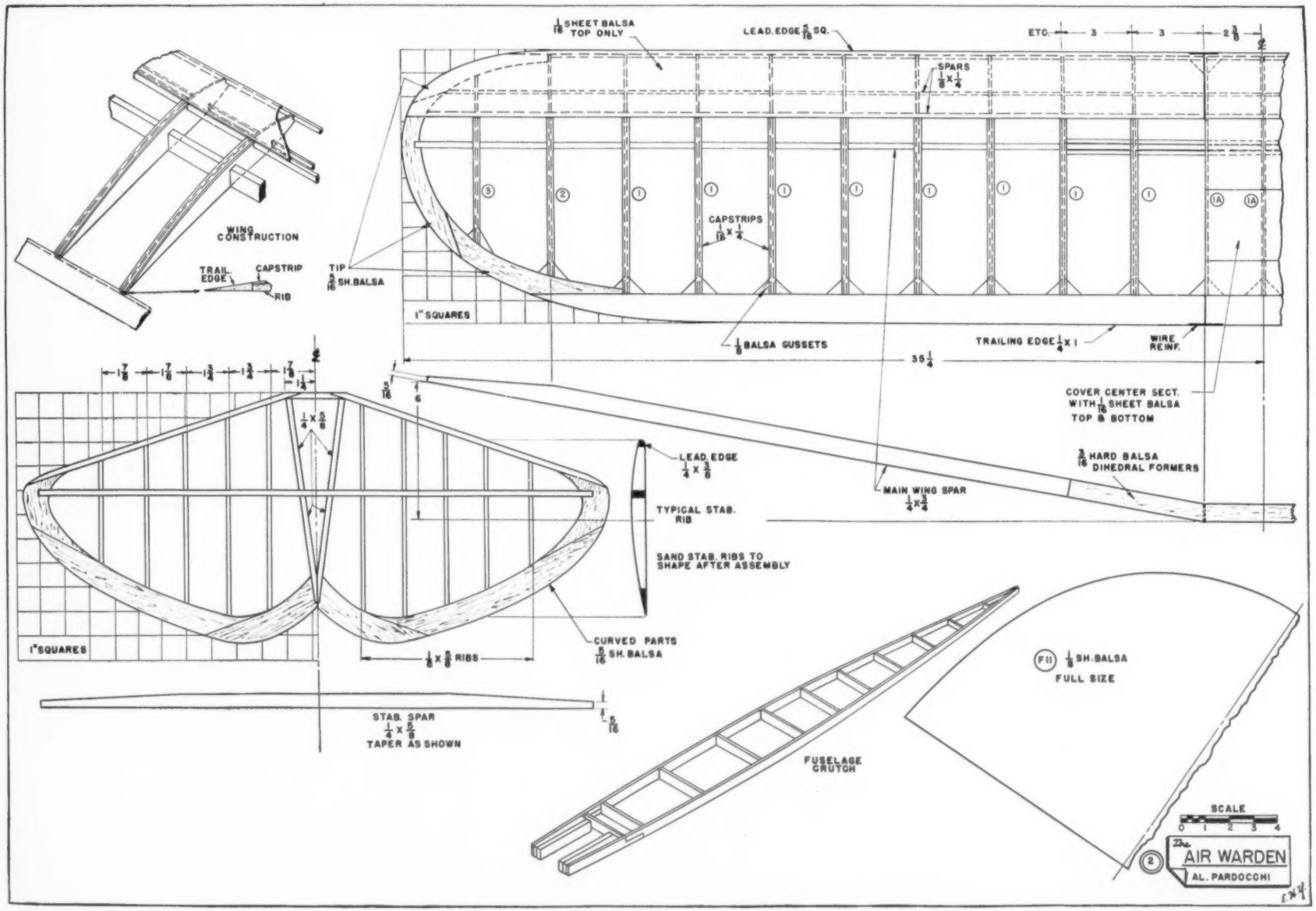
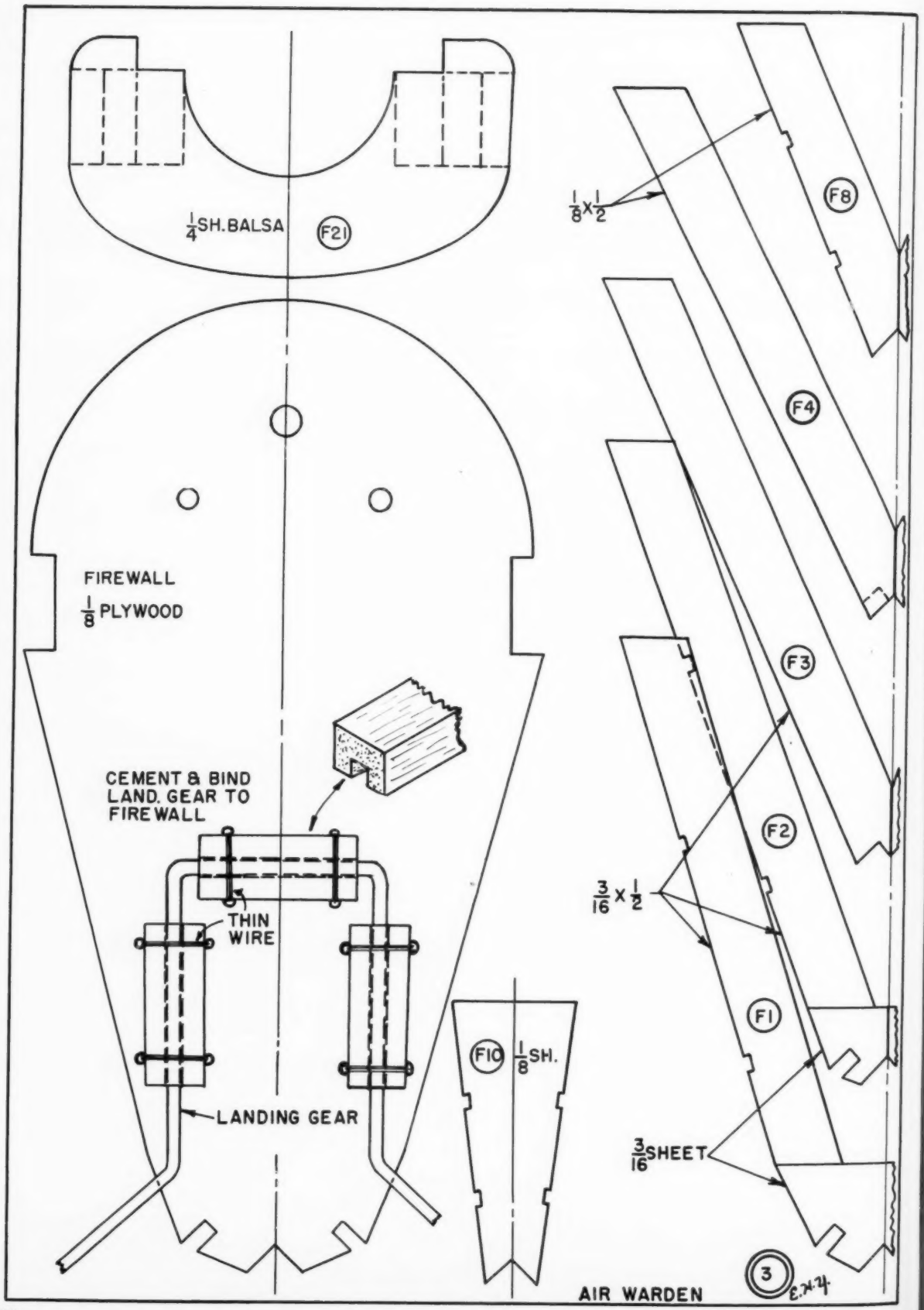
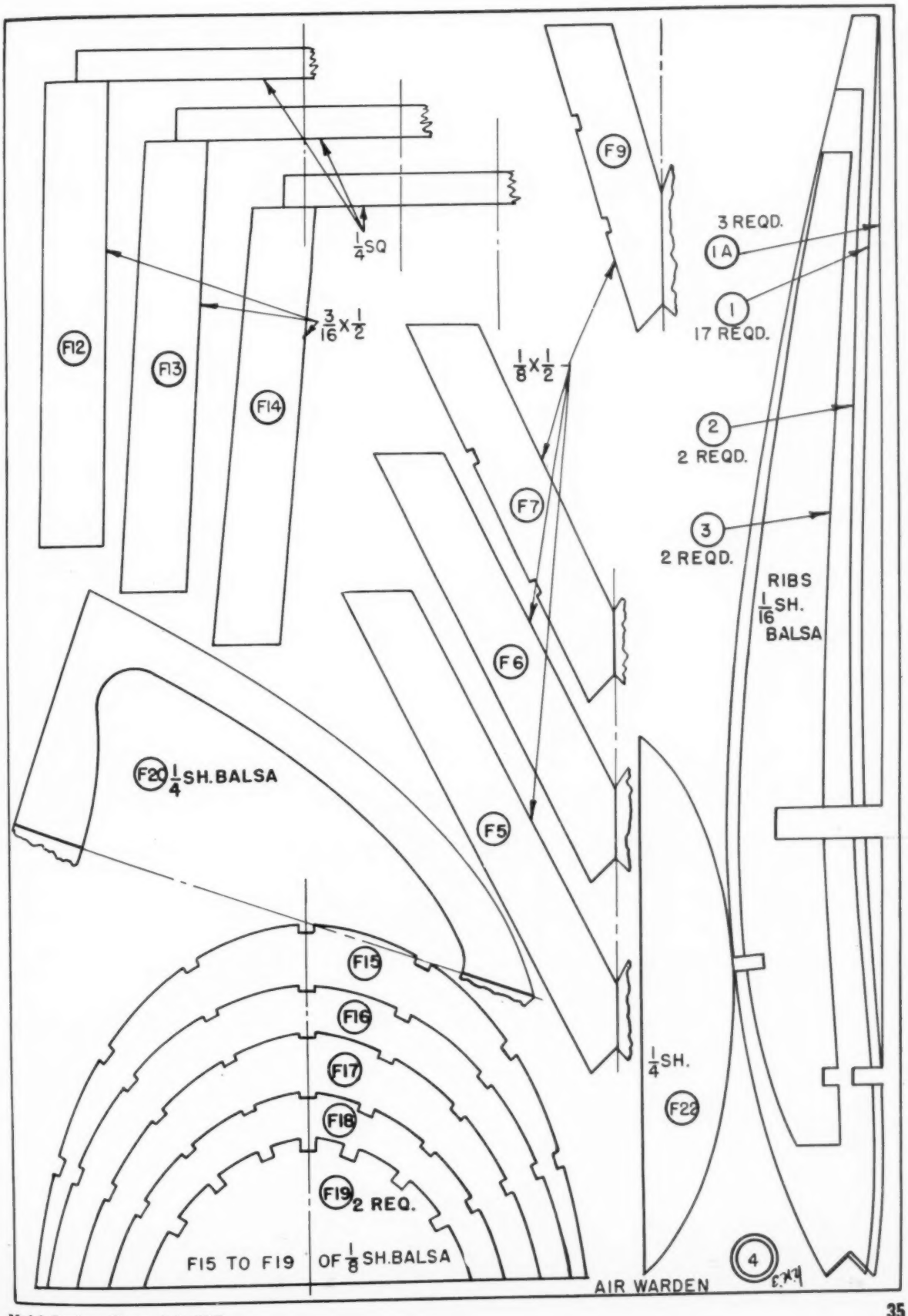
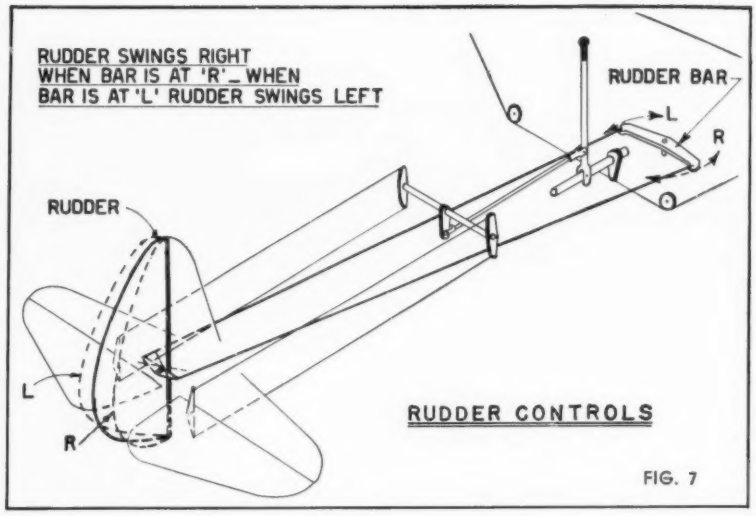
3
3
44
PLAN VIEW
1/4 SQ.
1/2" SQUARES
F22
COVER CABIN WITH 1/16 SHEET BALSA
1/8 SH. BALSA
F20
1/8 X 1/4
1/4 SH. BALSA OUTLINE
1/4 SQ.
TAB-1/4 SH. BALSA
ALUM. HINGES
F11
SIDE VIEW
F21
F12
F13
F14
F15
F16
F17
F18
F19
HOOK-.045 M.W.
CARVE NOSE BLOCKS OF MEDIUM BALSA
3/16 DOWEL
TIMER
STRINGERS 1/8 X 1/4
3/16 DOWEL
1/8 DOWEL
F10
CENTER OF GRAVITY
F1
F2
F3
F4
F5
F6
F7
F8
F9
1/4 SH. BALSA
1/2" SQUARES
5/16 SQ.
1/2" SQUARES
CONDENSER
COIL
FIREWALL
FILL IN THIS BAY WITH 1/8 SH. BALSA
1/16 BRASS SCREWS & NUTS
BATTERY BOX 1/8 SHEET BALSA
CLIP-.040 BRASS STRIP
LANDING GEAR 1/8 DIA. M.W.
SCALE
0 1 2 3 4
Dr. AIR WARDEN
DESIGNED BY: AL PARDOCCHI OF THE SKY-SCRAPERS
DRAWN BY: ED. YULKE


1/16 SHEET BALSA TOP ONLY
LEAD. EDGE 5/16 SQ.
ETC. 3 3 2 3/8
SPARS 1/8 X 1/4
WING CONSTRUCTION
TRAIL. EDGE
CAPSTRIP
RIB
TIP 5/16 SH. BALSA
CAPSTRIPS 1/8 X 1/4
1" SQUARES
1/8 BALSA GUSSETS
TRAILING EDGE 1/4 X 1
WIRE REINF.
39 1/4
COVER CENTER SECT. WITH 1/16 SHEET BALSA TOP & BOTTOM
3/16 HARD BALSA DIHEDRAL FORMERS
MAIN WING SPAR 1/4 X 3/4
LEAD EDGE 1/4 X 3/8
TYPICAL STAB. RIB
SAND STAB. RIBS TO SHAPE AFTER ASSEMBLY
1" SQUARES
1/8 X 5/8 RIBS
CURVED PARTS 5/16 SH. BALSA
STAB. SPAR 1/4 X 5/8 TAPER AS SHOWN
FUSELAGE CRUTCH
(F11) 1/8 SH. BALSA FULL SIZE
SCALE
0 1 2 3 4
The AIR WARDEN
AL. PARDOCCHI


1/4 SH. BALSA
F21
FIREWALL
1/8 PLYWOOD
CEMENT & BIND LAND. GEAR TO FIREWALL
THIN WIRE
LANDING GEAR
F10
1/8 SH.
1/8 X 1/2
F8
F4
F3
F2
3/16 X 1/2
F1
3/16 SHEET
3
AIR WARDEN


F9
3 REQD.
1A
1
17 REQD.
$\frac{1}{4}$SQ
$\frac{3}{16}$X$\frac{1}{2}$
F12
F13
F14
$\frac{1}{8}$X$\frac{1}{2}$
2
2 REQD.
F7
3
2 REQD.
RIBS
$\frac{1}{16}$SH.
BALSA
F6
F20 $\frac{1}{4}$SH.BALSA
F5
F15
F16
F17
F18
$\frac{1}{4}$SH.
F22
F19 2 REQ.
F15 TO F19 OF $\frac{1}{8}$SH.BALSA
4
AIR WARDEN



Modeling Your Future In Aviation

(Continued from page 13)

Wing tip floats stabilize the plane when on the water, preventing it from tipping over sideways and wetting the wings. This type of ship operates from cruisers, battleships and other fighting craft and not from carriers; its function is to scout the enemy and provide information for fire control.

Some airplanes have two sets of wings, one above the other, such as the Vought SBU-1 in Fig. 4; these are called biplanes —and others having three sets, triplanes, shown in Fig. 5. During the early days of aviation biplanes and triplanes were quite common because this type of construction provides an easy way to rigidly brace the wings to the body. However as higher speeds became necessary, biplanes and triplane structures were discontinued in favor of monoplanes because their struts and wires created great resistance at high speeds. Dragging these struts and wires through the air use up a great deal of power that might otherwise be used for added speed.

You will note that in, Fig. 1, the monoplane wings have no external attachments, offering little resistance to the air as it speeds forward at 300 m.p.h. or more.

Other important parts of the airplane are the controls. Though an airplane such as a model will fly without them, they are required on large planes so the pilot may direct the craft to right or left, up or down, or roll it sideways. Some airplanes are very stable and will practically fly themselves, remaining on a level keel without requiring operation of the controls to balance the ship. Others, like military airplanes, are very sensitive and respond to the slightest movement of the controls by the pilot. In fighting craft this is necessary for quick maneuvering. Controls and control surfaces are shown in Figs. 6 and 7.

The ailerons in Fig. 6 form part of the wing trailing edge at the tips. Cables connect them to the control stick in front of the pilot; when the pilot moves the stick to the left the left aileron turns upward and the right one downward, as shown. The action is reversed when the stick is moved to the right. In this way the pilot can increase the lift of one wing and decrease it on the other, causing the plane to roll sideways. When the stick is moved right the deflected left aileron causes greater lift, while the right aileron causes reduced lift. No doubt you have watched an airplane bank to one side when circling; the wings instead of being horizontal are tilted. The plane is maneuvered into such an attitude by use of the ailerons.

The rudder, used to turn the ship to the right or left, is part of the vertical tail surface, shown in Fig. 7. This is controlled by a rudder bar which the pilot operates with his feet. Pushing the left foot forward turns the rudder to the left, pushing the right forward turns it to the right. In this way the airplane is turned left or right like a boat directed on the water. Turning the rudder right causes greater pressure on its right side, pushing the tail to the left and nosing the airplane to the right.

The pilot often wants to climb or descend. This is accomplished by the elevators, that form part of the stabilizer or horizontal tail surface trailing edge, shown in Fig. 6. In effect the elevators are the trailing edges of the two stabilizer halves. When raised, by pulling the stick backward as in position A, pressure is increased above the stabilizer, pushing down the tail and causing the airplane to climb. To descend, the stick is pushed forward, deflecting the elevators. This causes greater pressure under the stabilizer, lifting the tail and nosing over the airplane into a dive. To recover from this maneuver the stick is pulled back directing the plane upward again into level flight.

Many airplanes have other parts in addition to the fundamental ones just described. However these are auxiliary and contribute only to the operating efficiency of the basic units, comfort of passengers and crew, or to the convenient disposition of useful load such as baggage, bombs, guns or fuel.

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(Continued on page 52)

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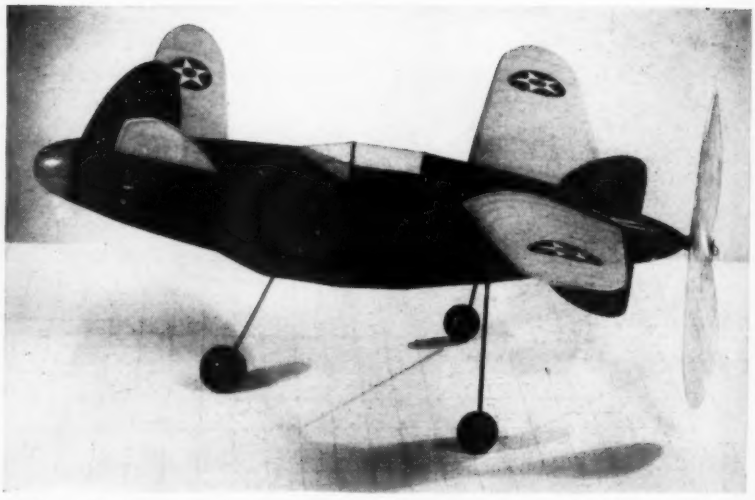

Fly a Fighter of the Future

(Continued from page 15)

the leading edge of the main wing; 4, a vertical fin or rudder is at the nose with small stabilizing fins at the rear, replacing the huge rear fins in the Army design.

The wheels on the model have not been made retractable, though such a feature would contribute to the flight of the model; they were made rigid for simplicity's sake. If the builder desires he can incorporate a retractable landing gear or fly the model without landing gear.

As this design is most uncommon you will find it extremely interesting to build and to watch its unique performance. Many new points in design may be learned from a study of this craft. A few flights will prove its efficiency, for it is an excellent flier.

It is designed for hand winding; however, if the builder prefers, the nose plug holding the front end of the motor may be made detachable and equipped with a wire hook for stretching and winding the motor. Flights, hand wound, of about one minute have been made; wound with a winder, this little plane will fly like a contest ship.

Building instructions follow:

Study the plans till you get a clear idea of the ship. To start the fuselage lay down the fuselage sides. This is best done by making one atop the other; a better job will result. When dry remove from the plan and cement in the crosspieces. Cut the formers out of sheet and cement in place where they are shown on the plan. The formers are not notched, but the stringers are pinned in place by eye as shown on the plan and then cemented to the formers.

When dry remove the pins and sand the fuselage smooth. The landing gear is of bent wire and cemented in place; the rear one is then cut to size from bamboo and streamlined. Add the wire axles and cement the struts in place. The wheels are now added; a drop of cement on the axle will hold them in place.

Now add the front and rear plugs which are cut to shape from balsa blocks and sanded. A couple of coats of cement over the plugs will toughen the wood and serve as a good base for the colored dope. Bend the rear hook and cement in place; in this case it is cemented to the nose plug. Cut the radiator to shape and add to the fuselage. Cover the cabin with a good clear grade of celluloid.

The propeller is now carved from the block shown on the plans. Be sure to carve a left-hand propeller, as this is a pusher and a left-hand propeller is required. Sand it smooth and dope several times because the propeller is the heart of the ship and its performance is as good as the propeller. The shaft is then added to the finished job. Give the prop several coats of dope and resand with wet and dry sandpaper. The propeller is waterproof from the dope and by using wet sandpaper a glass-like job will result.

The wing is not as difficult as it appears; this type of construction saves balsa as well as time, and a better wing will result. To start, lay down the leading and trailing edge on the plan; in this way the size of the ribs are determined. Cut all that are required to the size shown on the plan and trim the rib trailing edge to get the size of the rib.

The lower part of the ribs are added, and then the spar is tapered to fit and slipped in place. Cement to all the joints and do not trim the end of the spar till you fit it in the body as this is how the wing is attached to the fuselage. Now add the tips which are cut of sheet. Sand the whole wing to get all the rough spots off.

The elevator is made in the same manner as the wing, therefore it will need no explanation.

To get a good covering on any model there should be no rough spots, so go over the whole job and sand all the parts smooth. On the fuselage at least eight strips are added in order to get a good job. After it is covered paint with clear dope and set aside to dry.

At this time the rudder and fins are cut out of balsa and sanded smooth; give all parts a clear coat of dope, sand smooth again.

Now the wings are added to the fuselage; the paper where the wing is will have to be cut away as it is hard to get a good cement job when trying to cement the wood to tissue. Slip the wing spar in the place shown on the plan and at the same time cement the leading edge to the fuselage. The elevator is attached in the same manner, except that there is 2-1/2 degrees incidence.

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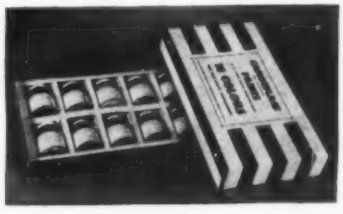

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After the wings are attached to the fuselage they are ready to cover. When doping the wings be sure to see that there aren't any warps because this will spoil the flight. At this time the fins and rudder can be added to the fuselage.

Now the model is ready to color; the body is olive drab and a red band is put around the fuselage; also add the decals. The wings are colored yellow, and when dry add the stars.

This ship flew well with six strands of 1/4" flat rubber and brought the ship to weight. Glide the ship; if it is nose heavy add a little weight to the tail. Wind the motor about a hundred times and launch the ship into the wind and watch its flight. To get the ship to turn, the front rudder is turned. The best time obtained with the motor hand-wound was fifty-six seconds, and the stable flights turned in amazed expert modelers. (Less power can be used if desired. Fine flights can be made with 10 strands of 1/8" flat rubber.)

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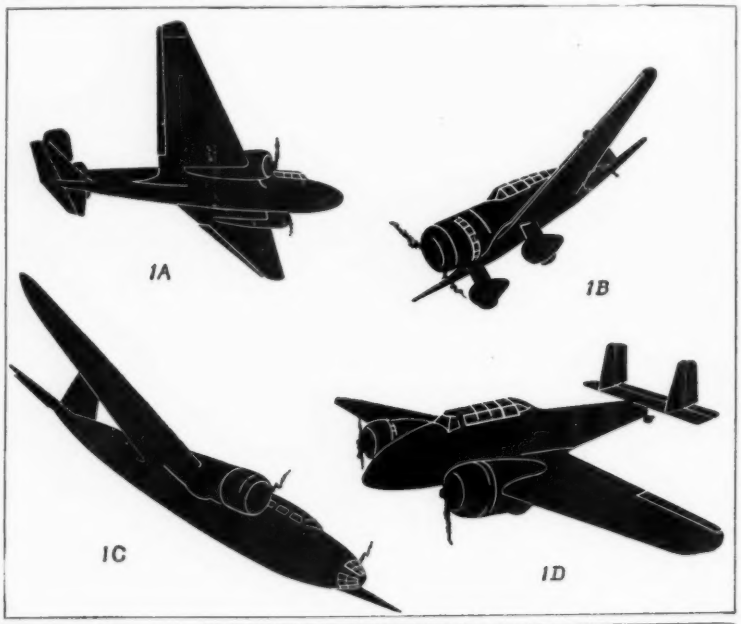
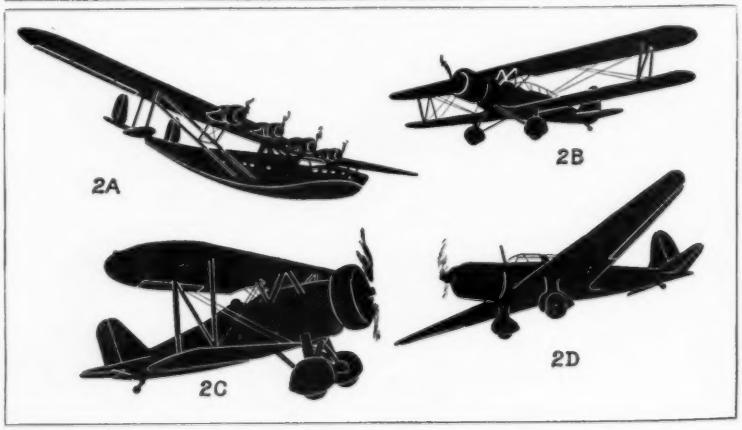
VICTORY





Sky Scouts

(Continued from page 14)

DESCRIPTIONS OF SILHOUETTES FOR SETS No. 1, 2, 3 AND 4

PLANE 1A—Mitsubishi twin engine long-range bomber used by the Japanese Imperial Army Air Corps is an all metal mid-wing monoplane with a retractable landing gear. Equipped with two 900 hp. Mitsubishi Kinsei air-cooled radial engines; accommodates a crew of three to five. Models similar to this were also designed as freight carriers for the Japan Airways Company for "survey" flights from Tokyo to Teheran as early as April 1939. Dimensions: Span, 82 ft.; length, 52 ft. 6 in.; height, 12 ft. 1½ in. Weight, loaded, 11,000 lbs. Cruising speed, 162 m.p.h.; endurance, 10 hours.

PLANE 1B—Mitsubishi "Karigane" Mk. II (Wild Goose), a single engine two place high performance fighter capable of great flight range is used in appreciable numbers by the Japanese Imperial Army Air Corps. Powered with an 800 hp. Mitsubishi A-14 fourteen cylinder radial air-cooled engine equipped with standard NACA cowl and constant speed Hamilton Standard two blade propeller, the ship has cantilever wing design with fixed undercarriage, of metal structure with flush riveted sheet metal covering. Ailerons are fabric covered. Split-type trailing edge flaps are placed beneath fuselage, extending to within three feet of each aileron. Fuselage is monocoque with oval crossection. Fixed sections of the tail surfaces are also metal covered, movable portions are fabric covered. Cockpit enclosure begins at about the center of the wing section, extends backwards flowing into the vertical tail surface. Pilot is located at forward cockpit while full navigational and communication facilities are incorporated into the aft pit for an observer. Dimensions: Span, 39 ft. 5 in; length, 27 ft. 11 in.; height, 11 ft. 6 in.; wing area, 258 sq. ft. Weight, loaded, 5,060 lbs. Maximum speed, 310 m.p.h.; cruising speed, 200 m.p.h.; range, 1,490 miles.

PLANE 1C—Nakajami Type 19, an all metal long range bimotor bomber equipped with two 870 hp. Mitsubishi Type IV engines. Of mid-wing cantilever design featuring monocoque construction and stressed skin flush riveted covering. It possesses split-type trailing edge flaps and retractable undercarriage folding forward and up into motor nacelles. Of clean aerodynamic design with statically and aerodynamically balanced elevators and rudder, the craft appears to possess excellent flight characteristics which make for good bomber aircraft. Information regarding performance or additional design characteristics and dimensions unfortunately are not available at this time.

PLANE 1D—Mitsubishi Otori (Phoenix) is an all metal low-wing cantilever type monoplane equipped with two 550 hp. Nakajima Kotobuki III radial air-cooled engines. First designed by order of the Asahi newspaper, it was flown over 2,000 miles from Tokyo to Bangkok non-stop. Capable of accommodating crews of three to five, this craft now becomes a formidable weapon. Modified undoubtedly from its inception, the Otori may now be in use by the Imperial Navy, operated from aircraft carriers. If such is the case one may safely venture a prediction that this type of machine will be among those used for bombing American strategic positions and cities. Unfortunately, at the time of this writing little information regarding it was available.

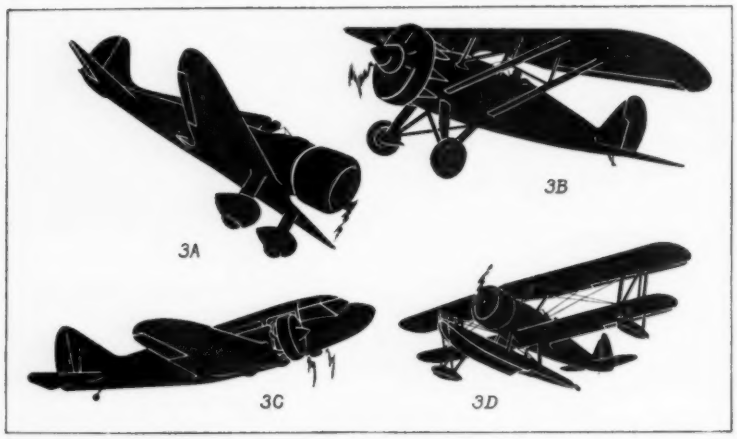
PLANE 2A—A long range Naval patrol bomber of unidentified manufacture greatly resembling the Sikorsky flying boats; apparently a product of the Japanese Naval Aircraft Factory. Reputed as having a 3,000 mile range, the craft undoubtedly compares in performance to our own four motor boats. Practically undistinguishable from the Sikorsky excepting for the "floating" type ailerons, no doubt a Germanic influence, this craft will prove extremely difficult to "spot."

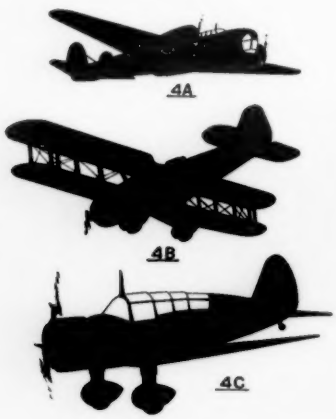
PLANE 2B—The Nakajima 96, a Naval Torpedo bomber used in close cooperation with the Nipponese Navy units and operable from aircraft carriers. Sufficiently formidable in fire power and armament although sluggish in appearance, the craft assumes an important role in Japan's war efforts. Easier to "spot" than many of the other Japanese fighters because of its somewhat "dated" lines, the Nakajima 96's appear to be much like a Hollywood Production. In appearance it possesses a little of everything of '30 vintage.

PLANE 2C—The Nakajima 95, single seat shipboard fighter. Capable of some 200 miles per hour, the craft is believed to be a "souped up" version of the Nakajima 90 originally powered with 450 h.p. Japanese manufactured Bristol "Jupiter," renamed the "Hotobuki." In appearance, the craft is identical to the Boeing P-12 excepting for the wheel pants which are typically "British." Lacking in fire-power, and easily recognizable, the tiny Navy fighter will undoubtedly find it "tough sledding" after Uncle Sam's lads spot it.

PLANE 2D—The Mitsubishi 97, a light bomber serving the Mikado's Army efficiently and effectively. In appearance it resembles the Northrop A-17 with semi-enclosed type wheel pants similar to those first adopted by the Curtiss Hawks of past years. It is powered by a single, liquid cooled engine of unknown make and horse power. Its somewhat blunt shaped nose, slender cockpit enclosure and strikingly outmodish undercarriage should make it readily recognizable to all Sky Scouts and Aircraft Spotters.

PLANE 3A—The Nakajima 97, single seat low wing fighter assigned both to the Japanese Army and Navy squadrons. Powered by a radial engine completely cowled, the craft is equipped with two fixed machine guns of unknown caliber synchronized to fire through a three-bladed propeller. Its thin wing may house two additional guns; however this is doubtful. Greatly resembling the first low-wing Boeing fighters, the "97" becomes easy prey to the Sky Scout inasmuch as its thin oval fuselage, fixed landing gear, and forward located cockpit with its oversize headrest cannot





be associated with any other fighting craft used by the Japanese. Reputed as having a speed in excess to 250 miles per hour, and an endurance range of approximately five hours, the appearance of this craft automatically forewarns of Naval units nearby, and of impending Naval action.

PLANE 3B—The Nakajima "91," single seat high wing fighter of '37 vintage. Powered by an imitation Bristol Jupiter engine, the craft is capable of speeds in the 200 MPH neighborhood and has proven to be a very maneuverable and capable fighter. It mounts two Vickers machine guns firing through the propeller. The engine is encircled by an anti-drag ring while each individual cylinder is faired by a cone placed directly aft of the engine. Its complex array of struts, and antiquated engine fairing arrangements are its primary points of recognition. The craft appears to have a fabric covered wing and tail. The fuselage is fabric covered aft of the cylinder fairing to the tail surfaces. The forward portion is of necessity metal.

PLANE 3C—Mitsubishi "Hinazuru" (Young Crane) is the Japanese version of the English Airspeed Envoy. Originally manufactured by the Mitsubishi Company under license along with the required "Lynx" IV-C engines as an eight passenger transport and now fitted for military assignments as a bomber. The conversion from transport to bomber requires only the addition of bomb racks and machine gunners turret. Designs permitting this conversion were first developed in 1936 and have hence been molded to perfection. The Envoy or "Hinazuru," as the little "yellow men" call it, is a low wing cantilever monoplane of wood construction, with covering of plywood and fabric. The craft has a speed well within the 200 MPH range and a flight range of over 600 miles. Its initial climb is about 1,250 ft. per min. and its service ceiling approximately 22,000 ft.

PLANE 3D—The Kawanishi 95, two place Naval observation craft equipped with float and capable of operating from battleships similar to our own Voughts. Powered with a radial engine of unidentified manufacture, completely housed in NACA type cowling, the Kawanishi bears a striking resemblance to the early Chance Vought single float fighters used by the United States Navy. The resemblance is almost exact except for the odd shaped rudder which presumably "honorable" Japanese designers have changed primarily to avoid "unfavorable" criticism from the originators of the design. The craft is armed with fixed and movable guns and also carries the equivalent of our 100 lb. bombs beneath the wings. Two such bombs are carried on this Jap craft.

PLANE 4A—Known as Army type 98, in reality a Fiat BR 20M first adapted by the Japanese Army in 1938. Eighty aircraft were purchased by the Nipponese and commissioned immediately. After extensive trials, the airplanes proved satisfactory and arrangements were made to produce these in Japan under license. Since then, large quantities of these bombers were delivered to Army squadrons and have seen considerable action in every Jap theater of operation including Pearl Harbor.

The craft was originally powered by two 1,030 h.p. Fiat A80 RC41 air cooled motors. These it is believed are also being manufactured under license by Japanese manufacturers at the present time although under a Jap name. Construction is all metal with both metal and fabric covering.

The craft mounts three flexible machine guns: one in the nose, another in a retractable Breda turret at the top of the fuselage, and another in a prone position beneath the fuselage aft of the wings. Normal flight crew numbers five men. The craft is known to have a 2550 lb. bomb capacity with a range of 1,240 miles.

Dimensions are as follows: Span, 70 ft. 6 in.; length, 52 ft. 10 in.; height, 14 ft. 1 in.; wing area 796 sq. ft. . . . Weight—empty 14,300 lbs.; loaded 22,220 lbs.; wing loading 27.9 lbs. per sq. ft. . . . Max. speed, 268 m.p.h. at 16,400 ft. Max. speed at sea level, 233 m.p.h. Max. cruising speed, 217 m.p.h. Initial rate of climb 1,000 ft. per min. Service ceiling 29,520 ft.

PLANE 4B—The Kawanishi 96, dive bomber. Used aboard carriers, the Kawanishi 96 acts as scout bomber and torpedo carrier alternately. It is powered by an air cooled radial engine of unknown manufacture, and carries a crew of two in addition to a half ton of bombs. No details as to performance or armament are available at this time.

PLANE 4C—The Nakajima 98, two seat light bomber, details of which are not available as yet. The craft is believed to be used by Army squadrons and described as "quite formidable."

(Note: Information regarding the Kawanishi 96 and the Nakajima 98 will be published for M.A.N. readers and SKY SCOUTS the moment it becomes available.)

VICTORY

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Radio Remote Control

(Continued from page 21)

of the copper tubing until it appears at the other end opening, and pull it out a few inches. With a hook pull about 2" of length of wire from the center opening. This inside wire is the grid coil, which should be carefully watched in wiring that the ends of this grid coil cross and go to opposite grid terminals on the tube socket as shown in the wiring diagram of Fig. 7. The antenna is coupled to the outside copper plate coil by tapping directly to the coil with alligator clips. Condensers are connected in series with the antenna leads to the feed-through insulators, as shown in the diagram of Fig. 7, to prevent any high voltage direct current from appearing at the antenna—this is a precaution taken for protection against shock.

Tube type determines the socket; however, in all cases a low loss type socket, such as isolantite, should be installed. For battery operation use type RK43, but if this type is not available or if a type 19 tube is at hand it can be used with addition of an extra dry cell in the filament circuit and a four ohm, one watt, fixed resistor connected in series with one of the filament wires.

Both type RK43 and 19 require a standard six contact socket. Types 53, 6A6, 6N7 or 6N7G can be used with higher power inputs. The 6A6, 6N7 and 6N7G tubes are good where a storage battery supplies filament voltage. The 6A6 and 53 require a seven contact (.855 inch pin-circle diameter) socket, and the 6N7 and 6N7G type tubes require standard octal sockets. Type 53 is useful where an alternating current power supply is available, its filament voltage being two and one-half volts. When using the 53, 6A6, 6N7, or 6N7G the cathode is connected directly to the negative filament, shown by the dashed line in Fig. 7. For the advanced radio amateur interested in higher power input type 815 should be considered.

Connected in series with the B plus lead are two pin jacks; these are used for connecting to the two pin jacks of the conjulator or other control switch or a milliameter for observing the plate current.

A complete discussion of antennae, power supplies for radio control transmitters and the procedure for tuning will be presented in a near future issue of MODEL AIRPLANE NEWS.

PARTS LIST

1 15 Micromicrofarad midget variable condenser
2 .001 Microfarad mica fixed condensers
1 .0001 Microfarad mica fixed condenser
1 Resistor—5 watts-5000 ohms for 6N7, 6N7G, 6A6 or 53 type tube
10,000 ohms for 19 and RK 43
1 2.5 Millihenry radio frequency choke coil
1 Radio tube (see article for type)
4 Stand-off insulators—one inch high
2 Feed-thru insulators—one and one-half inches high
1 Low loss tube socket (see article for type)
1 Sixteen inch length of one-quarter inch diameter copper tubing
1 Two and one-half inch length of one-quarter inch diameter insulated shaft extension
1 One-quarter inch shaft coupler
2 Tip jacks
2 Alligator clips
1 Knob
Miscellaneous wire and hardware

VICTORY

Only the Uninformed Call Them Toys

(Continued from page 23)

We could go on, but you see our point, don't you? Here's just one model airplane club which has contributed all this new blood to the field of aviation during the past several years. Just so the record will be straight, we tell you that the club mentioned is the Junior Aviation League of Boston which at this very moment has hundreds of new recruits on its rolls who are becoming just as "air-conditioned" as the young fellows we have mentioned.

When you realize that this club is just one of thousands throughout the country, and that these boys are just a handful of the many hundreds of thousands who have gone from model aviation on into aviation, you can understand why we see red whenever somebody comes along who refuses to admit the value of aeromodeling as a pre-training school and feeder line for full-scale aviation.

Not long ago, and we mention this at the risk of being repetitious, a model airplane club in Kansas City disappeared off the face of the map. The advisor to this club was Clarence Mooney, now secretary of the National Aviation Training Association. When this model club failed to reply to correspondence sent out by the National Aeronautic Association over a period of time, inquiry was made which revealed that the entire club had found its way into aviation through employment in aircraft factories, airport work, and allied positions.

If you want to get a clear picture of what model aviation is doing for the youth of the country, as well as for aviation itself, we recommend for your close attention the series of editorials which have been appearing in MODEL AIRPLANE NEWS during the past months. The uninitiate may think them evangelical, but, brother, once you, too, see the value of aeromodeling, you will go down the line and agree word for word with what has been said in these editorials. We only hope that this publication will reproduce those masterpieces and make them available to educators everywhere.

Frankly and, using some good understandable American slang, you know and we know that every sincere model airplane builder has "something on the ball." He or she, as the case may be, provides a solid foundation both for American air power and for supremacy in commercial and private aviation after the war.

Not only the model builders but our model magazines reflect this "something

extra." Knowing that MODEL AIRPLANE NEWS would never blow its own horn, we think you should be advised of the fact that the authoritative magazine *Newsweek* reported that so accurate was MODEL AIRPLANE NEWS' reporting of full-scale aviation developments and so much ahead of time was much of its news that aviation leaders were subscribing to MODEL AIRPLANE NEWS in order to keep up to the latest events in the senior aviation field. We think that is swell. And if these Aviation leaders can get an idea at the same time of how important model aviation is to their industry, maybe we will get a little more recognition for our hobby.

VICTORY

Westland Whirlwind

(Continued from page 27)

is braced to the rear to give protection in the event of a nose-over in landing. The hatch slides rearward for ingress and egress.

The tail surfaces are of all metal structure, fabric covering being used on the single rudder and elevators. The rudder is split to provide clearance for the horizontal stabilizer. The horizontal stabilizer carries bulbous fairing to provide perfect streamlining, the prime factor in this fighter. Trim tabs are provided on all control surfaces to ease the work of the pilot flying with unsymmetrical loading.

The engine nacelles are circular cross-sectioned and neatly faired for minimum drag. They are of slightly larger cross-section than the fuselage and carry the engine and landing gear structures. The latter is of conventional main gear and tail wheel design, each main wheel being supported by twin oleo shock struts mounted on either side of each wheel. Drag links are attached aft up into the nacelle. The entire assembly is completely retractable within the engine nacelle, hydraulic jacks (actuating struts) breaking the drag links and folding the wheels up and to the rear into the nacelle, large clam shell doors folding over the opening. The tail wheel is of a single strut forked type and is also fully retractable and sealed in unison with the main gear.

Power is provided by two Rolls Royce Peregrine engines, which are generally similar to the famed Merlin engine produced by the same firm but have been specifically designed to operate on 87 Octane fuel which is not so costly as the 100 Octane aviation fuel now in use by most high powered engines. The Peregrine has a cubic displacement of 1,296 cubic inches and is a conventional 12-cylinder Vee liquid cooled engine. It has a take-off power of 765 H.P. @ 3,000 r.p.m.; an international rating of 860 H.P. @ 2,850 r.p.m. @ 13,500 feet; and a maximum rating of 885 H.P. @ 3,000 r.p.m. @ 15,000 feet. (British ratings vary considerably in their definition from those of the U.S. and thus the formulating of an "international" rating which is accepted here as the official power of the Peregrine.)

The engines are cooled by two long, rectangular radiators set in the leading edge of each inner wing panel. They drive

three-bladed constant speed deHaviland (Hamilton-Standard license) propellers. The exhaust manifolds are located on the outboard side of each cylinder bank and large extensions have been used on the aft end of these as "flame-dampeners" which serves to hide the glare of the exhaust when the Whirlwind is used as a night fighter, a tactical mission of its design of equal importance to that of its day fighting mission.

Armament aboard the Whirlwind consists of four 20 millimeter Hispano-Suiza aerial cannons all mounted in the nose of the fuselage, two above and two below. These cannon have a rate of fire of 150 rounds per minute of high explosive incendiary shells at a muzzle velocity of 2,875 feet per second! A total of 600 rounds of ammunition is carried of various types depending upon the purpose for which the flight is intended.

The Whirlwind has a top speed of 383 miles per hour at sea level and 418 at 22,000 feet at 3,000 r.p.m. with full supercharging. It cruises at 330 miles per hour and has a landing speed of 69 miles per hour. It has a service ceiling of 29,400 feet and a maximum ceiling of 33,250 feet.

Wing span is 45 feet, length 31 feet 6 inches from spinner to tail, 30 feet from the fuselage nose to tail. It stands 11 feet 7 inches high and has a gross loaded weight of 16,500 pounds.

The Whirlwind is in quantity production by the huge Westland works at Yeovil in Somerset as well as in the Vickers and Brown & Co. shadow works in the Midlands throughout England. Should the Westland fighter of World War II carry on the venerable tradition of the Westland Fighter of World War I, most assuredly will the battle for democracy be carried forth on staunch wings and able engines. The Fighter Command can well muster its forces in a final drive with the Whirlwind under their fingers alongside the Americans, Australians, Chinese and Russians in the greatest conflict the world has ever seen!

VICTORY

Winged Caravan

(Continued from page 7)

production line and were checked out (one hour's test flight time). And this vast aerial caravan was pointed in a single direction: toward a similar center in Florida, the jumping off place for the East. The pursuit and light-bomber planes were flown to various shipping centers, crated, sealed against the elements, hoisted aboard ship and sent out on the perilous sea-lanes. But the giant bombers, too vital to spare from action, are superbly fitted for the long delivery flights.

With all these giant planes flying one-way to Florida, air and train facilities became taxed to the limit with returning pilots. Buses and private limousines were pressed into services; and in emergencies, the giant bombers themselves were spared long enough to carry as many as two dozen pilots back to the factory fields. Only citizens with official government transactions were permitted on the airlines. Southern California and New York became centers of the Ferry Command and prime fields were constructed to which the planes were flown by company pilots to lighten the back-breaking work of the ferry pilots. Seattle, home of the mightiest of all mighty bombers, became a beehive of thundering motors, hasty check-flights and quick take-offs.

Gathered in Florida, the Ferry Command turned it eyes across the unpredictable Atlantic and thought in terms of not a single plane but thousands of planes. Not a record-breaking trans-Atlantic hop this, such as would have made the front pages only three years ago. This was to be mass migrations of giant birds, a scheduled route across an expanse which once dared even the hardiest pilot and the strongest plane.

The Ferry Command did not find a wilderness awaiting them, for pioneering Pan-American Airways had already completed the preliminary preparations for a world airway, had finished the essential survey of the trans-Atlantic portion. Bases had been established in Brazil and in Africa from which to center operations. But dozens more were needed; and in this lay the task of the Ferry Command.

From Florida the huge bombers winged their way to the giant Brazilian base to prepare for the trans-Atlantic hop. There the new planes must be carefully inspected, not for wear or damage, but to insure that all the necessary parts are functioning perfectly, that each adjustment is correct, that each detail part is carrying its share of the load. Extra fuel tanks must be fitted and gallon upon gallon of fuel made available to fill them. Badly needed supplies capable of being carried by plane are assembled here and installed. Medical supplies, aircraft spare parts and assemblies, tools, weapons, papers and maps, telephone lines and equipment, all the manifold items needed at the African bases are loaded on ships in the quantities consistent with great fuel load.

From Brazil the giant bomber takes off, loaded to within a pound of its permissible overload weight. Out across the Atlantic it wings, climbing higher as its gas load diminishes, its throbbing motors chanting a song of dependability, its wings straining it upward, its pilot and crew guiding it unerringly towards Africa.

On that great continent the task is multiplied a thousandfold. For there are no fertile regions providing water, timber and stone necessary for the construction required; no machines, no equipment such as is easily found or shipped into Brazil. Bathurst in Gambia is the promised landfall, the guiding light of the trans-Atlantic hop. Here a huge field sprang up, almost within the shadow of Dakar and its perilous political turmoil. But Gambia was the nearest suitable landing spot, almost at the limit of the fuel capacity of the great winged warplanes.

The pursuits and light bombers which make the journey by ship are convoyed directly into Freetown and Lagos in Nigeria so that their wings might be stretched and the journey speeded. With the arrival of the big planes came the need of still more bases to accommodate the fast but short-ranged combat planes. Between these ports and Khartoum, Egypt, lay thousands of miles of arid desert upon which had to be built landing fields.

An open field or a sandy desert stretch is not the adequate airport a layman might assume. The sand is loosely packed and

GRUMMAN F3F1
U. S. NAVY SHIPBOARD FIGHTER

32" Span. Length 24". 1" Scale

A fine detailed model with retractable landing gear, 4" turned balsa motor front, 3 oz. grey dope, ½ oz. yellow, 2 oz. glue etc., all parts printed on balsa, 10" propeller, wheels, rubber motor, full size drawing, and all parts. This fighter plane is wheels, full size drawing, and all parts. This fighter plane is used in large numbers on the aircraft carriers. Const. Set complete, postpaid **$3.75**

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THE MOST EXCLUSIVE AND FINEST EQUIPPED MODEL IN THE WORLD. MOVABLE CONTROLS WORK FROM COCKPIT. A special de luxe model, one of the most beautiful ever made. Set contains a 4½" scale Wright Cyclone celluloid motor, detailed push rods, fins, etc., like real motor, 4⅛" aluminum cowl, 10" steel type carved prop shown, 2⅛" wheels, tail wheel, star and rudder insignia and lettering, windshield, instrument board, flying wires, 4 aluminum step plates, aluminum wing walks, ready cut wheel pants, washers, 3 oz. grey paint, ½ oz. yellow, ½ oz. red, 2 oz. glue, etc. All other parts are printed on balsa wood 33"x44" scale drawing. Const. set, complete in labeled box, postpaid..... **$4.50**

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40" Span. Length 35". 1/8" Scale. Color Silver

A beautiful model of the world's fastest bomber. Set has all parts printed on balsa, propellers, wheels, insignia, 4 oz. silver paint, 1 oz. black, motor fronts, full size scale drawing, and all parts to build. Construction set, postpaid **$4.75**

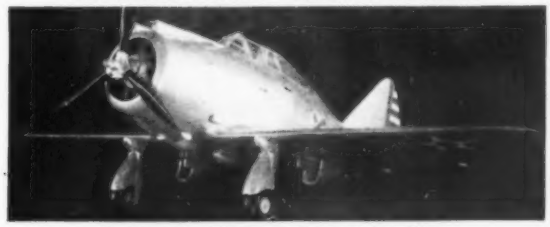
Thousands of this type of plane are fighting for the U. S. and Britain

NEW BELL P-39 AIRACOBRA
U. S. ARMY PURSUIT FIGHTER

34" Span. Length 29". 1" Scale. Weight 3½ oz. Color silver, etc.

Hundreds of the type of plane of which this is a model are now being used by the U. S. Army and Great Britain. Construction set includes all parts printed on balsa wood, balsa wheels, insignia, celluloid, axles, prop shaft, 3 oz. silver paint, ½ oz. black, 2 oz. glue, etc., turned prop spinner, full size scale drawing, and all parts to build. Packed in labeled gift box. Const. set, postpaid **$3.50**

SEVERSKY P35A ARMY PURSUIT



32" Span. Length 25". 1" Scale. Color, Silver

Set has 4" turned balsa motor front, 10" carved prop, balsa wheels, tail wheel, rubber, all parts printed on balsa, 3 oz. silver dope, ½ oz. black, 2 oz. glue, etc., insignia, and full size scale drawing. New improved model has retractable landing gear and movable controls from cockpit. Set, postpaid..... **$3.25**

BOEING B-17 FLYING FORTRESS BOMBER

44" Span. Length 30". Color Silver. Weight 6 oz.

Set has all parts printed on balsa, four 2" turned balsa motor fronts, four 4" carved props, celluloid wheels, set of paints, glue, and full size drawing. Set, postpaid **$4.50**

De Luxe set with 4 aluminum cowls, 4 celluloid motors, 4 metal props, and 2 M & M Air Wheels. De Luxe Set, postpaid **$6.25**

3 NEW MASTERPIECE DE LUXE SOLID MODELS *with completely finished bodies*

REPUBLIC P43 LANCER SOLID

14" Span. Length 9". 3/8" Scale. Solid Exhibition Model

Set has completed finished fuselage, headrest attached, cockpit cut out, etc., scale cast motor, cast propeller, wheels, paints, wings, etc., cut to shape, drawing, etc. Set, postpaid..... **$2.25**

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14" Span. Length 12". 3/8" Scale Solid Exhibition Model

Set has completely finished balsa fuselage, wings, etc., cut to outline, cast propeller, paints, drawing, and all parts. Set, postpaid **$2.00**

CURTISS F11C4 SOLID MODEL

10½" Span. Length 7½"

This is a special de luxe solid model. Set has completely finished balsa fuselage, cockpit cut out, routed pants, wings cut to shape, 1⅛" de luxe cast motor, alum. cowl, 3 bladed cast prop, paints, drawing and all parts. Set p.p..... **$1.75**

1942 CATALOG

Large 6" photos of latest models, gas models, motors, etc.

New Catalog No. 8

Send 10c coin

CURTISS SO3C1 SCOUT FIGHTER

30" Span. Length 27". Color, Silver and Yellow

Const. set has all parts printed on balsa, carved prop, set of paints, glue, insignia, drawing, and all parts. Postpaid **$3.00**

GRUMMAN F5F1 FIGHTER

24" Span. Length 17". Weight 3 oz.

Const. set has all parts printed on balsa, balsa motor fronts, carved 7" props, grey and yellow dope, glue, full size drawings, and all parts. Const. set, postpaid **$3.00**

ORDERING INSTRUCTIONS

Orders sent west of Mississippi, add 15c postage—Foreign, 20c.

MINIATURE AIRCRAFT CORP.

83 DANIEL LOW TERRACE STATEN ISLAND, N. Y.

it shifts quickly, often as much as ten feet in as many hours. Solid, dependable runways were required—runways of crushed rock, of gravel and asphalt layers. These materials could not be found in the middle of the desert but had to be transported for hundreds of miles from suitable quarries and sources in the hills. Thousands of black-skinned heat-resistant natives hoisted boulders upon their backs and trekked across the blazing dunes. Hundreds of camels were assembled into caravans to transport the rock, gravel, fuel and oil tins, lumber, machinery and other essential items which no man-made truck could carry five miles into the treacherous desert dunes.

As a result of this man-killing toil, the fields began to assume shape. The caravans marched slowly but relentlessly to the chosen sites and deposited their weighty loads. American engineers laid out runways, built barracks and depots, brought up spare parts and supplies by the ton. First one field was declared ready, then another, until a rough line stretched across the shimmering sands. The first huge bomber made the trip, then another, then a dozen, then a hundred. And now thousands of planes have made the trip. A life-line of supply has been established over which the vitals of this air war are being nourished.

From Khartoum the route progressed northward to Cairo, the principal Middle East base, where it joined the British Royal Air Force supply line with huge bombers and fighters winging from England. Here American and British mechanics work side-by-side servicing the tortured warplanes, putting them back in top shape for the third and last leg of the journey. From Cairo the line continues Eastward across Arabia to Karachi, India and thence to Calcutta where it branches off to various front line squadrons in need of the equipment. Australia, headquarters of MacArthur's vital command, receives planes and gives them a thorough overhaul.

From these far Pacific bases the planes are sent up to the front and into action. From Cairo, hundreds of planes fly northward to the embattled Russians. British and American planes fly wing-to-wing over these last legs, for there is no distinction made between members of the United nations. Every country, every factory, every man who is fighting the Axis is a brother in this giant undertaking, and a bomb destroys its target irrespective of the markings on the side of the bombing plane.

Three-quarters of the distance around the globe to meet an enemy who dares to dispute the same ocean that laps our Pacific shores? Thousands of tons of equipment, millions of man-hours of labor, just to transport planes out to Australia and the South Pacific? Perhaps it does seem fantastic—unless one consideration is borne in mind. By boat, it would take 32 days to cover the distance from San Francisco to Australia—more than four weeks. The Ferry Command flies two-thirds around the world in just *one week!*

What are some of the problems to be solved in maintaining this supply, once it has been established? Among the more difficult is the constant supply of fuel to each individual base. It cannot be flown in by the bombers because they need every ounce they can carry for their own consumption to make the trip.

Camels have been pressed into service, each beast carrying 35 gallons in tin cans, and the loss in this fuel runs as high as 25% due to cans working loose and dropping into the sand; or being dropped when being lifted down from the camel's back by the native workers. It must be protected against sand, which would quickly wreck an engine by working through strainers and into cylinders. Fuel is more precious than gold out there at those bases. And thousands of gallons are needed daily for the job when it is borne in mind that a single Flying Fortress can carry 1750 gallons in one filling!

The problem of repair work and spare parts loomed large and still is a difficult one for maintenance crews. New planes develop troubles much more quickly than thoroughly used ones, because new parts must be broken in and often malfunction for hundreds of hours before they are discovered. Flights are normally made at night to give repair crews as many daylight hours as possible to work.

Communication and planning is continually bogging down as the organization grows and expands. Each plane must be under proper central control at all times in order to maintain an orderly procedure for the work. And signals while in flight must be kept to a minimum to prevent prowling enemy fighters or ground crews from learning too much about the service. Pilots must fill in forms so correct parts will be available and the plane be in perfect condition for the long, perilous next leg. Dispatches must be made so that the planes are evenly spaced on arrival to allow harassed ground crews to prepare their equipment for minimum stopover.

These mechanics must be masters of the trade, because a half-million-dollar bomber cannot be kept idle at a remote base for weeks awaiting one vitally needed part while destruction might be raining down on sorely pressed troops at the front.

The spectre of sabotage is continually present. There is no assurance that the natives are not in the pay of Hitler or his brother cutthroats. A tiny handful of the vast reaches of sand in one of a hundred valves, operating units and controls could easily destroy what many willing hands have built. The pilots and base commanders must check and double-check each repair or service work done on each ship to be sure the worker is smiling *with* you, not *at* you!

But this gargantuan task is not without its humorous side, for these men from Mars are simple human beings, even as you and I. The British and Americans disagree on the setting of tables and the selection of foods even at these remote outposts where a luxurious meal might consist of bottled water, rancid ham and dry bread toasted by the atmosphere. A small thing like a bath becomes a luxury; and the importance of a shave cannot be overestimated, as these long haul crews do their job much more efficiently when they are clean shaven and bathed. No filthy clothes and beards on the Ferry Command, even in the Sahara!

Piloting the planes is not the toughest part of the job. Imagine sleeping in broad daylight under a sun beating down on you with a temperature of 120-130 degrees, a mosquito net over your head to prevent

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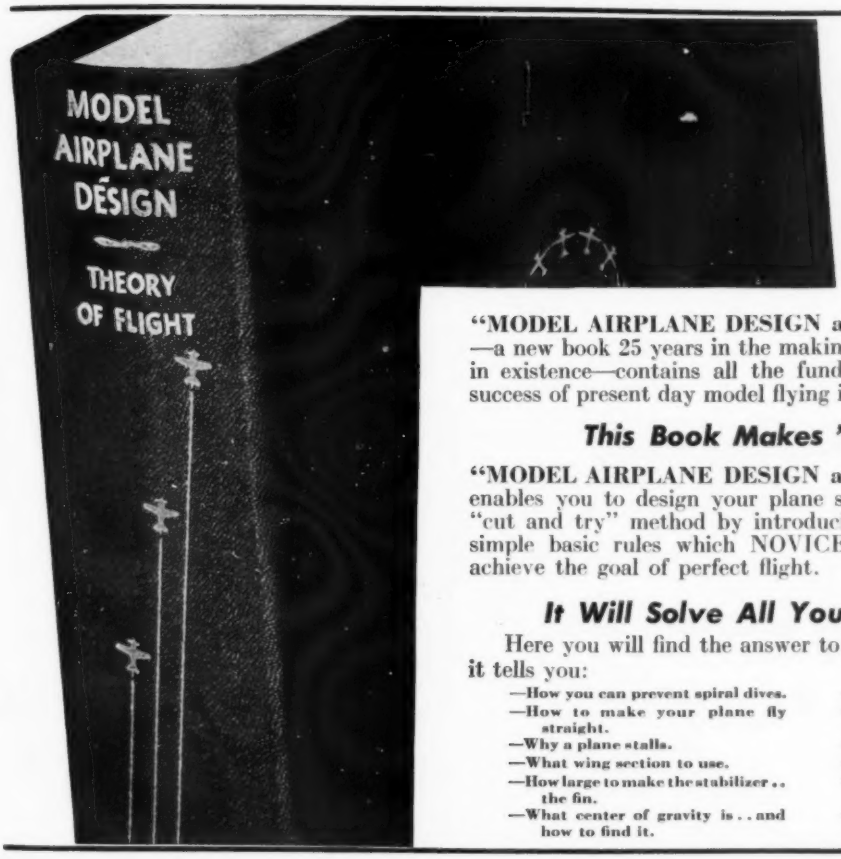

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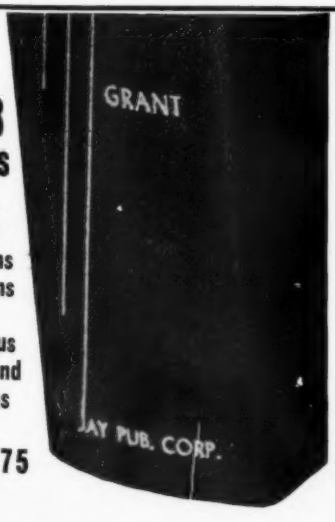

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The Author
CHARLES HAMPSON GRANT
—Princeton Engineering School; Massachusetts Institute of Technology; member of the "Early Birds"; for 20 years the world's foremost model flying authority; for the past ten years Editor of MODEL AIRPLANE NEWS.

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the bombing attacks of a variety of bugs and insects! But sleep is essential before the long night flight ahead.

It's a tough job, a mean job, one of the most nerve-wracking in this war—but the Ferry Command is doing its job, doing it under the worst possible odds. Perhaps it is rough in spots yet, but if getting the planes to the troops means ultimate victory, then the Ferry Command has won the war—by delivering the goods with a smile that hides a load of headaches, burning throats, aching muscles, and tired eyes. Here's to the Wingéd Caravan!

VICTORY

The Flying Air Warden

(Continued from page 29)

to simplify building and to reduce possibility of mistakes. Fuselage construction is built around a longitudinal "crutch," 44 inches long, formed of two stringers.

The balsa part, which starts with bulkhead No. 1 and continues to the rear of the ship, is of 1/4" x 3/4" medium stock. Note that it tapers from bulkhead F3 to a depth of 5/16" at the rear. This is a straight taper and represents a straight line from F3 to the rear, from the bottom upward. The gumwood motor bearers continue from F1 where they are spliced to the balsa crutch to the front. You will see that these bearers (which are of any hardwood 1/4" x 3/4") are notched and cemented to the balsa crutch. After both crutch sides have been cut and assembled, lay the pieces flat side down and insert the cross pieces in their proper places. Cement them thoroughly, and when they have dried, the hardwood filler pieces are cut and cemented in place. Let this assembly dry thoroughly, re-cementing all joints, particularly those near the F1 section. You will probably notice that at the point where the motor bearer meets the balsa crutch, the bearer will protrude slightly. Sand this down until the sides are perfectly smooth.

Now turn the crutch over so that the flat side is on top. For best results a piece of wood 2-7/16" wide should be lightly cemented across the front of the crutch to hold the assembly throughout the rest of the building process. It will greatly aid in maintaining the rigidity of the structure.

The next step is the cabin formation. This structure is built of 3/16" x 1/2" medium balsa for the uprights. The top of the cabin is 1/4" square throughout. Note especially that the uprights are set in 1/16" from the outside of the crutch. This is to allow for the covering of 1/16" sheeting, which is part of the cabin. You will see that the firewall, F11 and F15, are also "cut-in" to allow for covering; the entire assembly greatly adds to the strength of the completed cabin.

However, do not put on the 1/16" sheet at this time. After the outline of the cabin is in, cement F15 in place. Then cover with sheet from the middle of F14 to F15.

To complete the first step in the cabin, cut F20 from 1/4" sheet and cement in place. You will see that notches are cut in F15, and that these have been covered by the 1/16" sheet covering. Cut through the sheeting into the former to allow for the stringers which are coming up.

Your next step is to cut out formers F16, F17, F18 and F19 and cement them in place. Let them dry thoroughly and cement into place the 1/8" square stringers. On the middle formers (16, 17 and 18), the notches are only 1/16" deep and therefore the stringers extend 1/16" above the curve outline; however, on F19 the notches are 1/8", for at this point the stringers are flush with the arc of the former.

Now comes the firewall. The template for it is shown on the plans and you should take particular pains to follow the diagram as closely as possible. You'd better draw up a form for the landing gear and bend the gear of 1/8" wire to follow the form exactly. Before cementing the landing gear in place, sand the firewall smooth and give it a coat of cement, rubbing it in well with the fingers.

When this has dried the landing gear is affixed. It is secured by grooved basswood strips 5/16" x 1/2". This assembly may be made stronger by "sewing" the gear to the firewall with heavy thread or fishline. Check the landing gear so the wheels will be level with the firewall. When the entire assembly is dry it should be cemented to the crutch. Now cement the 1/8" x 3/4" crosspiece across the crutch behind the wall. F11 is then put in and the 1/16" sheet from the firewall back to F12 applied.

In forming the bottom of the fuselage, your first step is building the bottom V's which act as formers. They are made of 3/16" x 1/2" medium stock from F1 to F4, and of 1/8" x 1/2" soft from F5 to F-10. These should be cut, cemented and set aside to dry before being applied. Then they are inserted in their proper places; make sure they are at right angles to the crutch when finally in place. The ship may be placed bottom-side-up in this construction stage. The rear stem piece is then cut from 1/4" sheet and cemented in place.

The stringers on the fuselage bottom are of 1/4" x 1/8" medium balsa. If you closely follow the notches on the V's you cannot go wrong on this detail. From F7 back to the end the stringers are sanded until at the stempiece they are smooth with the pointed rear. The keel of 5/16" square is next cemented in place and you'll have to secure it with rubber until it has dried thoroughly. The tail skid of 1/4" sheet balsa (very hard) is next added.

The cowl is best formed from two pieces of medium balsa 2" x 5" x 5". If such size wood is not obtainable, several smaller pieces may be laminated. The side profile of the cowl is indicated by the cross-squared side view; the rear of the cowl takes its form from the firewall.

Cement the two pieces lightly together, cut it out to rough shape (both profile and front view). Now place the block beneath the crutch below the motor bearers and filler and in front of the firewall. Mark with a pencil on top of the block the position of the outside of the bearer and the inside of the filler pieces.

Next separate the blocks and start carving. You must not cut the sides (at the top) within the space occupied by the

bearer and filler pieces. Otherwise the cowl formation is simply a matter of cutting and sanding until you are ready to re-cement the two half pieces and cement the finished job to the firewall and bearer assembly. The top half of the cowling is formed from soft balsa blocks which are cemented to the firewall and bearer assembly and sanded to contour with the firewall as indicated.

The next step in completing the fuselage is to cover the cabin with 1/16" sheet. By careful application, taking plenty of time, this will result in a beautifully realistic job.

In forming the windows, cut the 1/16" sheet to window outline and cement it to a strip of celluloid, then cement the entire assembly in place. Next cut out the windshield and cement in its proper position.

As a final step in the fuselage, build the battery box, making sure it is solid and well constructed. Install this box, coil, condenser and timer, and wire the ship. Do this job carefully — it will save many hours of trouble on the field if the ignition circuit is electrically perfect.

Sheeting (1/8" soft balsa) is cemented between the firewall and F1, as shown on the plans. The wing and elevator holding dowels are inserted and firmly cemented. After a careful sanding the fuselage is ready for covering. Silk is preferred for covering the body; however, heavy bamboo paper may be used if silk is not obtainable.

FLYING SURFACES—Before building it will be necessary to scale up the plans for the rudder and stabilizer. This assembly is particularly rugged and if built properly will never warp or twist in any way. Construction is simple with a few special instructions. The trailing edge of the elevator is not tapered at the point it joins the rudder, merely rounded; it tapers from this point, however, to the trailing edge.

Scale up the wing plan before starting to build this important part. Build over the plans; but you will have to elevate the bottom spar 1/8" from the plan because of the rib undercamber. Ribs are fitted in their positions on the main spar and cemented in place. Next attach the leading and trailing edges.

Unless you already have tapered trailing edges it is best to sand these before assembling to the ribs. Cement the top spars in position, attach the wing tips, and after cementing the gussets in place allow each wing half to dry thoroughly. Be careful in making the center section; be sure the dihedral cuts are properly made and according to plan. Note in the center section that both top and bottom are sheet covered.

The halves are cemented together next. Your following step is to sheet-cover the leading edge. The cap strips extend from the end of the sheet covering to the trailing edge. They are sanded down until they fair into the trailing edge.

Wings and tail assemblies are covered with light bamboo paper, if available. In an emergency almost any material may be used.

TEST FLYING—The ship should balance at a point approximately 1/3 of the chord behind the leading edge. Test glide the ship first before making a power flight, and if glide is too steep insert incidence beneath the leading edge of the wing. If the glide is stalling incidence should be inserted under the trailing edge of the wing, or under the leading edge of the elevator. Not more than 1/16" should be required for any adjustment. The motor should be mounted with 1 or 2 degrees of right thrust, to control torque effect. This should allow the ship to fly left under power. However, if the ship does not fly to the left under power, use a very slight amount of left rudder.

Understand that the Air Warden, properly built, will fly to the left under power and in the glide. To compensate for too much left turn under power, the right thrust is used. Usually the ship will fly to the left under neutral rudder; however, if it does not, you may have to use a very slight amount of left rudder.

CONCLUSION—When you have finished your Air Warden we know you will have a job to be proud of. It is unusually rugged and will stand all kinds of power flying abuse and general knocking around. Aside from being built for performance and beauty it's a ship that can "take it." If you have any comments or wish advice on the ship write the author, in care of MODEL AIRPLANE NEWS.

VICTORY

This "Sticker" Always Wins!

(Continued from page 9)

station No. 17 first, then join the sides at station No. 6. Let these joints dry thoroughly, then place the nose block in position. This gives the fuselage proper shape from the top view. Then add remaining cross braces. The fuselage is now ready for the sheeting. Cut the 1/8" sheet to shape and place it on the top and bottom of the nose. When dry the fuselage is ready for sanding. Sand the nose shape perfectly round at station No. 1 so that it blends into the spinner.

When boring the hole in the block, make absolutely sure that it is dead center. Sand the finished fuselage thoroughly and it will then be ready to cover with tissue. When covering be sure to have the grain of paper run lengthwise with the fuselage as it prevents wrinkles and gives the ship better appearance and efficiency. Shrink the tissue with a spray of water and apply two or three coats of nitrate dope.

WING CONSTRUCTION: The wing

is known as a polyhedral type, and the easiest way to start is to cut one template from hard balsa, using this template to cut out 36 ribs from a medium hard piece of 1/16" sheet. Then take a piece of 1/8" sheet 36" x 4" and draw the leading and trailing edges outline on this piece and cut out the center. Notch the inside of the leading and trailing edges and place the formers in position.

The wing should be laid on a flat surface when placing the formers in position. As this is a sparless wing, special care must be taken to prevent twists and warps. When the wing is thoroughly dry, remove it from the plans and sand until the finish is real smooth, sanding the outside trailing edge to a knife edge.

Follow the plans and you will find correct dihedral to be easy, starting with the tips first. Place the gussets in their proper position; important because it gives the wing strength. Cover the wing one section at a time, the bottom sections first. Run the grain of the tissue with the wing span, making sure that the paper is glued to every rib on the bottom. Avoid wrinkles. Spray the tissue with water and when dry apply two or three coats of dope. Pinning the wing down and doping one section at a time will prevent warps.

THE STABILIZER: Constructed the same as the wing, with the exception that there are no dihedral breaks.

THE RUDDERS: The rudders are shown full size on the plan and are made of 1/16" sheet balsa. They should be sanded to a fine finish and polished with two coats of dope.

THE SPINNER: The spinner and nose plug are made of hard balsa, the former turned on a lathe if possible. The propeller is made of a balsa block 7" x 2" x 1 1/2" straight grain. The plans are full size and the prop is started by cutting the front view first, then turning to the side view.

Insert the 3/32" plywood which gives the hub strength. Carve the prop and finish with fine sandpaper, then add several coats of dope which gives the prop a fine polish. Set the propeller in the spinner and the prop shaft can then be installed. Use plenty of glue on the spinner and nose plug to give it strength.

Balance the prop with solder, a counter made by rolling a piece of paper around a pencil and pouring hot lead into the mold, placing the wire in the lead while it is soft.

ASSEMBLING: Set the wing on the fuselage with rubber bands. Glue the stabilizer in place, making sure that it is in perfect alignment with the wing. When dry put fourteen strands of 3/16" flat rubber in the fuselage which should be broken in by stretching many times before using in the ship.

Put the prop in place and the ship is ready to fly.

FLYING ADJUSTMENT: As you test the model use a small piece of balsa wood, 3/16" will do, to give the wing proper incidence. Place the wood under the wing leading edge, hand launching the model several times to find the proper glide. Give the prop 60 or 70 winds and your model should have a fairly good climb and circle to the right. When it has reached this point give the motor full power. Now is the time the model will pay dividends for the amount of time spent in building it.

BILL OF MATERIALS

7 pieces 1/8" x 1/8" x 36" Med. hard balsa
1 sheet 1/8" x 3"
1 sheet 1/8" x 4" x 36"
1 block 7" x 2" x 1 1/2" propeller
1 sheet 1/16" x 3" x 36"
1 piece plywood 3/16"
2 oz. glue
2 oz. nitrate dope
1 dowel stick
1 piece piano wire 1/16" 18" long
3 sheets tissue

VICTORY

Modeling Your Future In Aviation

(Continued from page 36)

flimsy 40 m.p.h. pioneer planes made from slender wood members, wire and cloth. This development was accomplished only through constant experiment, study and work by thousands of ingenious men and women. Today, because of the work of these pioneers, the engineer has unlimited sources of information on aerodynamics, engines, strong intricate structures of the lightest possible metal, and many contributing arts and sciences.

When man was first inspired to fly no such information was available. Study of birds' flight provided the only solution. This was the origin of aeronautic science.

From the dawn of history man has always been intrigued by the flight of birds; naturally therefore man first attempted to solve the problem of flight by building models of birds. These first models were of the flapping wing type, for the early pioneers mistakenly believed that suspension in flight was attained by the wings beating down the air. Later they discovered that the flapping wings propelled the bird, while at the same time birds were suspended in flight by lift on the wings, generated by the bird's forward motion.

Attempts to build successful flapping wing models were finally discarded in favor of the soaring type of plane. It is then that pioneers realized the importance of the wing as a lifting surface rather than a means of propulsion.

At this time construction of man-carrying planes was not attempted; pioneers confined themselves to discovering flight's underlying principles through models. One of the early attempts was Henson's "Aerial" steam carriage, designed in 1842. It was constructed similarly to present day planes but discloses lack of the primary lift generating factor in its flat wing surfaces; all efficient wings are curved. Though powered with a 25 hp. steam engine and of considerable size, this model never left the ground.

However shortly afterward, in 1848, Stringfellow designed and constructed the first model airplane to fly. Though its flight was comparatively short, it established the basic principles which later made possible more successful machines.

Following this, early pioneers confined themselves chiefly to developing efficient lifting surfaces, and many experiments were carried on to establish the basic principles

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of the science.

Sufficient information was accumulated through these experiments with models to enable Lilenthal to construct the first motorless man carrying airplane, the glider. In the course of previous experiments great difficulty was encountered in working out principles of stability, and Lilenthal was the exponent of the belief that success could only be achieved by a pilot controlling and directing the airplane when in flight. Lilienthal therefore was the first to sidestep stability and substitute control. In this way he eliminated one of the greatest flight problems and was instrumental thereby in bringing about its early achievement.

Others, like Samuel Pierpont Langley, endeavored to solve the problem of stable flight without the human control. He belonged to the group who believed that stable man carrying craft could be developed by first building small models capable of stable flight, gradually increasing the size of each successive plane to an eventual full scale man carrying plane. Langley had built many successful models; the one prior to his full scale machine was of about 16 ft. spread, steam powered, and flew half a mile in free flight over the Potomac River.

The full size man carrying craft, built similar to the model, unfortunately was demolished due to faulty launching apparatus. He lacked funds to build a second craft. This ended Langley's practical experiments and resultant disappointment eventually led to his death.

Shortly afterward Wright demonstrated the first successful man carrying powered airplane.

Many others, like Bleriot, Farman, Paulhan, following the Wrights, built and flew man carrying planes. These men were working on the problem individually during the latter years of the 19th century and the early years of the 20th. After these pioneer planes the problem resolved itself into one of more powerful engines and increased airplane efficiency.

During all this development models played an important part; they were the starting point of all projects. Through them aerodynamics and structural details were worked out, and up to the present day, models have performed this essential function. No airplane is built without first being tested in model form, either in the wind tunnel or free flight.

Models have also served as a valuable means of education, for students, lacking the funds to build and fly large planes, have often founded their knowledge and experience upon extensive model experiments. The school from which sprang many of our prominent and expert engineers of today was a model club, the Aero Science Club of the 1910 to 1917 period. The value of models to attain a basis of aeronautical knowledge is being realized more fully with each passing day, and is now serving to train our young men for active part in the developing aviation era.

VICTORY

Airways

(Continued from page 25)

veloped by Nick Skuce of 606 McArthur Blvd., Oakland, Calif., who tells us that his wife, Ruth, has constructed a model just like it. The device is called the "Co-stab," and in effect is a small stabilizer placed above and to the rear of the main stabilizer and attached to its trailing edge by small vertical fins. Mr. Skuce says he has applied it to four other ships and apparently it has increased glide nearly 30% and fully eliminated undesired loops. Mr. Skuce doesn't tell us the angular setting of this surface, but we are sure he will be pleased to give further information about this upon request.

Robert L. Davis of Black River Falls, Wisc., sends us picture 2 of his "Vapor Trail" gas model—says it averages 2 min. on a 15 sec. motor run in calm evening air. Its motor run has never been more than 20 sec. On the fourth test flight, February 21st, it flew 12 min.; on its fortieth flight it flew 2 miles in 7 min. It has a tight corkscrew climb and a very flat glide. The wing has 3 degrees positive incidence and the elevator is at zero with the line of thrust high. The only adjustment is a trifle left rudder.

Picture 6 shows Bob Hansen of 12 Pillsburg Ave., Minneapolis, Minn., with his uncovered "Power House," a very neat job of frame construction. This ship is powered with a Forster 99. Now it is covered with silk, colored red and yellow; about 10 coats of yellow dope and 4 of red were applied, which were finished by rubbing with Berryloid rubbing compound and waxing.

The colored dope was put on with a sprayer attached to a vacuum cleaner. Now that many women are model builders they will not mind having their cleaner used for model construction.

Glider fans will be interested in this one: In picture 4, sent by Austin Rinaldi of 134 Zabriski St., Jersey City, N.J., you see a double or tandem wing glider. The long moment arm between the wings gives great steadiness in flight, and the extra weight, due to the length and stick, provides momentum for an extremely high climb.

Rinaldi writes that his club has been experimenting with these for some time and the one shown has turned in the best flight so far. It is simple to build and the wings are made of 1/8" x 2" balsa; an excellent contest ship. Rinaldi says further that he has another hand-launch glider made of pine with the exception of stabilizer and rudders. It gives excellent results and should be just the ship for contest work with the present balsa shortage.

Many builders have been very curious concerning model activities in Russia; and now we have a chance to tell something about them, for recently we have heard from Mr. T. Kostenko of Leningrad 28, Peter Lawuft str. 20 KW. 5, U.S.S.R., who tells us he is an aircraft engineer and model aircraft consultant, and has been fortunate enough to obtain a copy of MODEL AIRPLANE NEWS in spite of the war. He says:

"Our modelers here in Russia hold many world records for flying models, but MODEL AIRPLANE NEWS so far has printed no information about this."

We will, however, Mr. Kostenko, because you offer to send us some information about such activities in the near future.

Picture 4, which he sent, shows one of Russia's prominent hydro experts launching one of his hydro rubber powered models which flies more than 1-1/2 min. with an R.O.W. takeoff. Most of these ships are built of hardwood and fairly heavy material, because balsa is scarce in the Soviet Union.

Harold Alexander, High Point, N.C., a member of the Piedmont Model Club, sends us picture 5, which shows him at the High Point Speedway after a busy flying afternoon. The Speedway is used as a model airport by all 12 members of the Club, where members have been flying regularly for about 3 years.

In picture 9 you see one of the East Coast experts who is giving the boys a "run for their money." She is Miss Yolanda Di Nicola of 89 Newton St., Newark, N.J., holding her Ohlsson 23-powered gas job; this is her fourth ship. Mr. Elmer G. Powell of 279 Jackson Ave., Jersey City, N.J., who sent this information, says: "Miss Di Nicola's workmanship surpasses that of many models built by experts appearing at Eastern contests."

The ship has a span of 50"; wing area of 530 sq. in.; wing loading of 9 oz. Miss Di Nicola is secretary of the Jersey Airsquires club, composed entirely of gas model builders. There are two other women members, the Misses Doris Fredricks and Dorothy Boardingham.

In picture 7 is Sherman Schultz of 4170 Drexel Blvd., Chicago, with his now nonexistent "Fireball." The picture was taken several months ago but here is the story: This little ship was first powered by an Ohlsson 19 which gave it speeds up to 50 mph. Not satisfied, Schultz cut down the wingspan to a little over 2 ft. and put in an Ohlsson 23—the speed jumped to 55-60 mph.

"Then," he says, "I got reckless and put in a Super Cyclone. Timed with the timer given in the kit, we found the average speed for 3 complete circles was 103 mph., entirely unofficial but witnessed by 5 fellow schoolmates. On the 23rd flight the ship 'washed out,' which only goes to prove that balsa is not suitable for stresses incurred when a model lands at 60 degrees to the ground at 90 mph.

"I think you get what I mean—p-o-o-o-f

——splatter!!

"There must be an alibi of course, so here it is: the elevators were warped and all that thrust pulled it down."

(Editor's Note: Incidentally, Mr. Schultz is one of those readers of MODEL AIRPLANE NEWS who write the President of the United States, telling him what he thought of models as a means of education in aviation matter.)

Picture 13 was sent to us by the "Flying Triplets" of Jefferson, Wisc.—William Lucas, designer; Henry Fischer, electrician, and Joe Peichl, mechanic. The planes shown are their "babies" which they have transported many hundreds of miles to enter contests. They say that nothing will stop them but the war and lack of tires in the future. The ships are made exactly alike and turn in some fine performances.

Their careful lines indicate not only excellent workmanship but fine design; the dihedral is not excessive, line of thrust is quite high and side area is comparatively low relative to the c.g. This type of ship makes an excellent flier under all flight conditions. It is not a "one way" flier; that is, it doesn't just climb and glide, but will make horizontal flights as well.

Letters to the President

Though Russia and Germany started the aviation training of their young men by making it compulsory to design, build and fly models, our government has been slow to realize its educational value. In consequence manufacturers and dealers have been deprived of essential model building material under priorities regulations. This has affected every model builder in the country and has greatly curtailed his activity.

Believing that model building provides greater and more effective training in aviation than any other activity, MODEL AIRPLANE NEWS has been endeavoring to have this situation relieved. Consequently it is requested that every model builder throughout the country write the President personally, expressing his views and endeavoring to make clear the necessity of a model program without trifling material restrictions. Many have already written President Roosevelt and we hope other readers will do so immediately, for the more letters the President receives, the more will he recognize the importance of this problem.

Below is a copy of a letter written to the President by Henry Cole Jr., of 3305 N. 31 Street, Tacoma, Wash., winner of the 1941 Air Youth Scholarship Competition:

"I believe wholeheartedly in the necessity to maintain model aviation. I wish to report that I have written to the President on this vital matter.

"As an aeronautical engineering student at the University of Washington, I have come in contact with many young men in aviation. It is surprising that so many of them got their start in model building. With ten years of model building experience, I have little difficulty with the problems of aeronautics which I attribute directly to my model building training.

"I hope that other model builders will answer the call to save model aviation, not for themselves, but for the valuable training which it affords."

Following is an Honor Roll of others who have taken the trouble to write the President:

Henry S. Beers Jr., West Hartford, Conn.; John Reynolds, Albuquerque, N.M.; Harold Johnson, Stamford, Conn.; Ken Rosenberg, Greeley, Colo.; Leonard J. Policastro, Brooklyn, N.Y.; Paul S. Montgomery, Oklahoma City, Okla.; Roland Hartsough, San Francisco, Calif.; Richard Kendrick Jr., Oakland, Calif.

Club News

Minnesota

Here is a club that is doing some fine work to supply the U.S. Navy with scale models—

The St. Paul Modeleers Club of 572 N. Snelling, under the all-seeing eye of Mr. Lytton Calrow has opened up a Navy Model Airplane project at 99 E. 6th Street. This club, with help from interested friends, completed 33 models the first 2 weeks of April and *all* 33 have been accepted for the Navy. Fifteen of these models were used at the recent Sportsman Show in Minneapolis.

For the splendid cooperation given by the builders, an hour airplane ride is to be given to the first five members or nonmembers. They are Ray Hunn, Bob Gusenheyner, Don Moorehead, Harriet Calrow and Ralph Swenderman.

What other model club can match this? This fine work is greatly due to the excellent supervision of Mr. Al Schwab, who gives his full time to the project and no

"monkey business" is allowed, as the above figures show. All St. Paul hats are off to Al Schwab.

New Jersey

Andrew Canino of Vineland writes:

"The Vineland Aeronauts have spent the winter with friendly competition between the S.J.G.M.A.A., Woodbury Aeronauts, Pitman Soaring Panthers and the Glassboro Club. We have discontinued our monthly meets now as every club is preparing for the big meets to be held this summer."

New York

We hear from H. deBolt of 1050 Elmwood Ave., Buffalo, contest director of the Buffalo Aeronauts, of which he writes in detail. His comments may serve as an example of activities for other clubs.

"The Buffalo Aeronuts is composed of 25 of Buffalo's top-flight model builders, and holds an A.M.A. charter. We have been organized over a year now and believe we have made some sort of name for ourselves throughout upper New York.

"Our membership is practically all older fellows who have had several seasons of flying before they came into our outfit. Our purpose has not been to keep out the younger fellows, but rather to form a nucleus which could gain some distinction before bringing the new builders in. In this way we have hoped to establish a firm foundation on which to build an ever-expanding organization. This year we hope to firmly establish ourselves so that we can realize some of our objectives.

"Recently we held our first spring meeting and election of officers at our clubrooms; also committees for the coming season were appointed. Officers are: president, James Stevestor, a young upcoming modeler with great promise; vice-pres., Howard Holland, last year's president; secretary, Fred Smith, an old-timer with 14 years experience; treasurer, William Klussman.

"After the various committees were selected the contest committee met and arranged plans for our first contest. Inasmuch as our old field lies practically in the shadow of the huge new Curtiss-Wright plant, it was decided that we would use a fine field on the other side of town that has been set aside for this purpose by the County Park Commission. We went out and did a little flying from it after the meeting and it was well liked by all of us."

We hear that the Williamsburg Model Craftsmen airplane club has had a reorganization of officers; new officers are: president, Sid November; vice-pres., Semour Katz; secretary, Sam Heller; treasurer-publicity agent, Bernard Lavender. The club is open for new members, and if anyone is interested in joining they should contact Bernard Lavender, 305 S. 3 Street, Brooklyn, N.Y.

Puerto Rico

We are pleased to hear of activities in San Juan, Puerto Rico. Our informant tells us that:

"Recently here in Santurce, Puerto Rico, a few modelers formed a new gas model club, which is named 'The 24th Model Airplane Club'. Our president is Mr. M. A. Manzano; vice-president, William Moreno and secretary, José A. Carrasquillo.

"All the members are above 16 years old, and most of them are old in the hobby. We had a gas model meet on April 5, sponsored by this club, and Mr. Carl Goldberg was here. We are trying to make contests for all the modelers in Puerto Rico, to arouse more enthusiasm in models. Here in Puerto Rico we also have good modelers as in the States, for example we have an 'Ensign' but little modified according to his owner's ideas. It makes an average time of about 1:55 in 10 secs. motor run, in dead air."

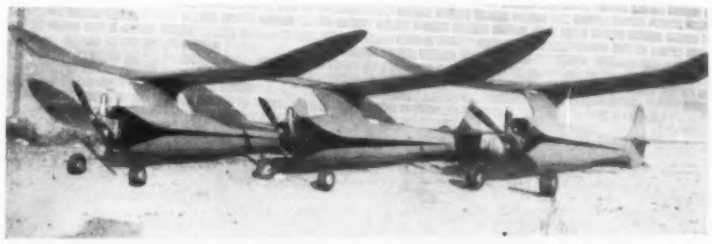
Contest Results

Following are results of some recent contests held throughout the country.

California

The East Bay Aeroneers Association of Oakland will fly on the least provocation. Whether prizes consist of enormous trophies or burlesque prizes, the competition is always just as keen.

The contest put on for us March 28th, sponsored by Henry's Hobby Shop, was an example of a burlesque contest, where a good time was had by all. A 10-cent entry fee was charged, and this gave the contestant the privilege of filling up on all



13. Three identical gas jobs built by Wm. Lucas, H. Fischer and Joe Peichl

the soda he could drink.

The day was fair with little wind, but thermals were few and far between; twenty-eight contestants entered and prizes were given in all the classes.

Thirteen-year-old Buddy Romak walked away with the top honors in class C with his Cyclone-powered Westerner; total time, 16:32. Close on his heels was Bill Steese with a time of 16.11, also with a Cyclone-powered Westerner. In third place was Eli Romak and fourth was Earle Romak, Buddy's brother.

In class B Jack Woodard took first with a total time of 6:46. R. R. Cole took second with a total of 3:42 and Jack Dyer was 3rd with a total of 2:45.

In class A Donald Haines was first; second was Gordon Peterson and third was Milton Taylor.

When the prizes were distributed a good laugh was had by all, for they included such items as women's bloomers, pliers, medals, dry kits with rubber bands and balsa wood and balsa gliders.

Here is a list of winners of the Fourth Annual contest of the Bakersfield Gas Model Airplane Association of Bakersfield, held April 12th before a crowd of approximately 4000 persons. Two hundred ten models were entered, coming from the bay area to San Diego.

The contest was considerably smaller than last year, when 400 models were entered; this is probably due to the war. Many model builders are now in the armed forces or work in southern California war plants and cannot get off to attend contests. Also they may not have tires.

	Winner	City	Total of 3 Flights
Class C:	Leroy Langston	Venice	47:34.5
	Bob White	Pasadena	44:14.8
	P. C. Oldershaw	Bakersfield	40:05.4
	Ray Acord	Los Angeles	25:36.2
	Dutch Van Tassel	Fresno	19:19.2
Class B:	G. Crossman	San Francisco	45:24.0
	Ralph Conn	Alhambra	34:35.4
	Ralph Linhoff	San Marino	30:11.8
	John Stenderup	Bakersfield	19:01.7
	Joe Mechol	Los Angeles	11:01.8
Class A:	W. H. Winter	Fresno	17:21.7
	Bob Hanford	Ocean Park	15:58.6
	John Stenderup	Bakersfield	15:11.2
	V. Oldershaw	Bakersfield	13:40.8
	Ray Gruenwold	Fresno	11:34.4

The contest was to have been A.M.A. sanctioned, but at the last minute it was discovered that *every* entrant had to be an A.M.A. member, which did not help matters any. Many California builders are not affiliated with the Academy.

Thermal conditions were excellent, but resulted in the loss of many models, which points to the need of dethermalizers and to the advantage of our Bakersfield marathon contest, details of which appeared in MODEL AIRPLANE NEWS earlier.

Michigan

The eighteenth Annual Metropolitan Detroit Schools Indoor Model Airplane Contest was held at Cass Technical High School Auditorium on March 21st, from one to five o'clock.

Over one hundred boys participated. The prize winners are as follows:

SPECIAL R.O.G. FOR BOYS UNDER THIRTEEN YEARS OF AGE

Ray Axford, 19240 Gainsborough, Cooke School, 12 years; time 57 seconds.

Erwin Green, 4205 Chalmers, St. John School, 9.

Clyde Boston, 3404 Montclair, Foch Intermediate, 12.
Jack Williams, 2120 Benteau, Foch Intermediate, 12.

R. O. G. FOR BOYS THIRTEEN TO SIXTEEN YEARS OF AGE

Bill Baldiga, 1293 Montclair, Foch Intermediate, 13 years, time 82 seconds.
Joe Pajakowski, 4350 Marlborough, Jackson Intermediate, 14.
Art Huchok, 17469 Dwyer, Burroughs Intermediate, 14.
Arthur Christ, 1276 Hart, Foch Intermediate, 14.
Bob Tanney, 9061 West Outer Drive, Cooke School, 13.

JUNIOR FUSELAGE FOR BOYS UNDER SIXTEEN YEARS OF AGE

Joseph Macay, 20178 Stotter, Wilbur Wright High, 15 years, time 120 seconds.
Jerry Wyliniski, 7567 Dobel, of Northeastern High School, 15.
David Heyser, 9301 Memorial, Mackenzie High School, 15.

SENIOR FUSELAGE FOR BOYS UNDER TWENTY-ONE YEARS OF AGE

George Sass, 3123 South Annabelle, Cass Technical High School, 17 years, time 368 seconds.
Jack Kezeliam, 1242 Waterman of Southwestern High School, 17.

OPEN CLASS DURATION FOR BOYS UNDER TWENTY-ONE YEARS OF AGE

Al Blatter, 6527 Stanton, Cass Technical, 16 years, time 446 seconds.
James Kahremanis, 3204 Gladstone of Cass Technical, 16.
George Sass, 3123 South Annabelle, Cass Technical, 17.
Don Paglia, 757 South Liebold, Cass Technical, 19.
Leonard Marzewski, 7322 Erbie, Cass Technical, 19.

Pennsylvania

Mr. Harry G. Vogler Jr. reports on the First Allegheny Mountain Area Model Aircraft Competition of 1942. It was held on March 29th at the I.G.M.A.A. Model Airport with 54 modelers, coming from the entire Tri-State area, competing. Winners were:

CLASS AB, GAS

Franklin Hall, Meadville, Pa.	804.6
Rob. Hall, Meadville	792.6
Jos. Patrick, Elm Grove, W. Va.	492
Richard Laughlin, Midland, Pa.	446.3
August Ondrusek, Ford City, Pa.	329
Marshall Stevens, Meadville	299

CLASS C, GAS

C. P. Tiers, Oakmont, Pa.	503.8
Jack Rote, IGMAA, Pgh., Pa.	468.2
Ken. Delannie, IGMAA, Canonsburg, Pa.	398
Wm. Anderson, Oakmont, Pa.	257
Bob Korn, Wheeling, W. Va.	218
James Morriss, Chester, W. Va.	211.8

RUBBER POWERED, FUSELAGE ROG

Jos Patrick, Elm Grove, W. Va.	753.8
Ronald Ganserwicz, Pittsburgh	301
Justus Merkel, Monaca, Pa.	298.2

STICK, H. L.

Louis Emerick, Houston	222
Ronald Ganserwicz, Pittsburgh	192
Harvey Boswarth, Washington, Pa.	187.2

GLIDER, TL

John Hall, Rogers, Ohio	186.9
Franklin Hall, Meadville	142.3
Theo. Stanko, Ford City, Pa.	137

Note: Times given are total time in seconds, and the flights were all for endurance, with the gas powered using a fifteen second motor run for their flights. Unassisted takeoff is the procedure of launching all ROG flights.

I.G.M.A.A. Unit No. 1 made the trip from headquarters in Pittsburgh to the flying area by way of Pittsburgh Motor Coach, which they chartered for the day. In this time of emergency this manner of travel will prove the most feasible and they plan to continue in this manner.

Coming Events

June 28—Hicksville, N.Y.—Contest sponsored by the Prop Spinners. Prizes to be awarded. Entry blank from William H. Fletcher, 87-08 Grand Ave., Elmhurst.

July 6—Walkerville, Ont., Canada—4th annual contest of Windsor Model Aircraft Club. Events are A, B, C gas, Wakefield, Tow-line glider (any class) and junior event for cabin models for contestants 14 and under. 1942 A.M.A. rules followed. Entry blank from Charles Fox, 793 Argyle Road, Walkerville, Ont.

June 28—Auburn, N.Y.—Contest sponsored by Auburn Modelers' Association; not a sanctioned meet. Prizes will be awarded. Entry blank from Glenn Cady, 230 State Street, Auburn.

June 14—South Bend, Ind.—4th annual meet of Mechiana Model Aero Club. Events are classes A, B, C gas. Cash and other prizes awarded. Entry blanks from Sonia Shetterly, Y.M.C.A., South Bend.

Fourth Annual New Jersey State Model Airplane Championship

Plans for the Fourth Annual New Jersey State Model Airplane Championship have just been announced by the Linden Model Aircraft Club. Title events will be held on July 12th at the former Cranford airport, Cranford, N.J. The meet will be held just two weeks before the National Championships at Chicago and will give an opportunity to modelers to prepare for that event. Contestants living in the eastern U.S. are eligible. Last year over 100 entrants from five states competed.

The contest has been sanctioned by the A.M.A. Five events for rubber-powered models have been scheduled on the program: Class C & D fuselage, Class C & D stick, and Class B glider events in the Senior class; and Class C & D fuselage, and glider B events in the Junior class. Record trials will also be held in Class C Glider and Class D tow-line glider events.

All contestants under 16 years of age will be classified as Juniors and those over that age as Seniors. Senior contestants must hold a license in the A.M.A., but Juniors need not. Models entered in all Junior and Senior events must conform to AMA regulations.

Trophies, medals and merchandise will be awarded to place winners in all events. The Linden Rotary Club trophy will be presented to the all-event winner in the Senior Class and the Recreation Commission trophy to the Junior.

Entry blanks may be secured by writing to Frank M. Krysiak, contest director at the Linden Recreation Commission office, Linden, N.J.

VICTORY

Flash News

(Continued from page 2)

aviator who participated in the record-breaking Moscow to San Jacinto, California, non-stop flight, has recently been made a major-general in the Russian Force and placed in command of an entire air brigade on the Western Front opposing the Luftwaffe.

Qualified civilian pilots are urged by the Navy to apply for appointment in the aviation-volunteer (transport) class. The requirements are 300 hours of flying time in aircraft of 65 horsepower or more and possession of an effective civilian pilot license. Qualified men will be immediately commissioned on a probationary status and after completion of a three-month refresher course at Pensacola will be permanently commissioned in the Naval Reserve. Apply at your local recruiting office.

Recent reports indicate that between 30,000 and 35,000 French military aviators, long prisoners in Nazi concentration camps, will soon be released, on condition that they take a refresher course to fit them for service in the planes of the Luftwaffe flying against British air attacks. There remains considerable doubt as to the probability of success of such a bold plan, it was reported.

Major T. C. Macaulay, aviation "Early Bird" and holder of many aviation records, has been re-called to active duty, although now 52 years of age. Macaulay joined the Curtiss Flying School at San Diego in 1912, and in 1914 ascended to 12,239 feet—a record. He also made a coast-to-coast flight in just 26 hours in 1919. Modern airliners do the job in exactly one-half that time.

No doubts now remain that this is an AIR-WAR, with the recent announcement that a total of $35,557,000,000 has so far been awarded to aircraft manufacturers for warplane construction and a total of 185,000 American airplanes are expected to be completed before 1943 ends. This will be, by far, the greatest aerial fleet in all of history and twice the size of the combined air forces of all the nations opposing us.

A new research and standardization "pool" has been formed by West Coast aviation manufacturers in an effort to more completely unify their production efforts. Consolidated, Douglas, Lockheed, North American, Northrop, Ryan, Vega, and Vultee have joined the association which will make processes, tools, plans, and equipment available to any of the member organization. The National Aircraft Standards Association is now completing plans to unify the eastern companies with this group and thus speed production by eliminating the "personality" of the many different airplane types and models which hamper the work of maintenance and inspection in service.

An amazing true story which reads like fiction recently found the headlines when Lieut. Hans Peter Krug of the German Luftwaffe was captured by FBI agents in a small hotel in San Antonio, Texas. The 22-year-old youth was shot down by British anti-aircraft fire on August 28, 1940, and later transferred to a prison camp in Ontario, Canada. Making good his escape, the youth crossed the border and started south across the whole of the United States, obviously headed for the Mexican border where he believed he would find freedom. Using forged papers, the young Nazi stated he had little trouble and that his experiences had only confirmed his belief that Americans were "stupid and gullible." He will have plenty of time in the future to alter this belief.

Air Commodore George Jones has been appointed Chief-of-Staff of the Royal Australian Air Force, it was recently announced by Prime Minister John W. Curtis of Australia. Commodore Jones will work directly under General George H. Brett, U.S.A.F., Commander-in-Chief of the Allied Air Forces in the far Pacific, which has been doing such valiant work against the Japanese attacks.

If bombs DO fall in your neighborhood, call the Army—not the police or air raid officers. These were the instructions recently issued by the Army Air Force public relations officers who state emphatically that dud bombs will be handled by trained Army crews and that civilians may easily touch the bomb off in a courageous effort to remove it.

The first contingent of model aircraft builders have finished nearly 20,000 of the 500,000 goal set by Navy Secretary Knox and are well on their way towards the first 100,000, it was recently announced by the Navy Department. Models are of the solid-scale type and are being accepted by the Navy for use in training work. If you have not yet enrolled, your local newspaper will supply you with information and drawings of the 20 different types to be built.

The first contingent of American Curtiss fighter planes have arrived at Malta to aid the beleagured island in its defense against the almost constant attacks by the Luftwaffe. Following closely on the President's announcement that American naval units are now operating in the Mediterranean, came the news that American fliers are now in action against the German Messerschmitt fighters.

A daring tale of mid-sea rescue was recently unfolded when it was revealed that Naval patrol planes rescued more than half of the crew of 44 aboard the S.S. Stonehaven, British steamer, which went down from a torpedo off the coast of Florida recently. The patrol planes, on constant air and anti-submarine patrol, dropped into the water alongside and pulled the water-soaked survivors aboard. The submarine was not sighted although vast stretches of water were carefully scrutinized.

Swelling the growing list of highly commendatory letters the workers have received, the Lockheed aircraft company has received another letter from Lt. General Henry H. Arnold, complimenting them on the quality and workmanship of their sturdy Hudson twin-engine bombers. This most

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recent letter told of an attack on a Hudson by a Junkers JU-88 over the Bay of Biscay, and, after a running fight, the destruction of the Axis raider by machine-gun fire from the Hudson's deadly rear turret. Many other manufacturers have received similiar letters, mostly from high-ranking British Royal Air Force officers. A fine tribute for the swell job American aircraft workers are doing!

Although North American states that the cost of warplanes has fallen off 1/3 since 1940, it may interest many to know that a single-seat fighter plane costs $120,000, a medium bomber $447,000, and a flying fortress between $650,000 and $1,616,000 (B-19 type) per each!

L. G. (Larry) Fritz, veteran flier and vice-president in charge of operations for TWA, has been ordered to active duty with the Army Air Forces, where he will become chief of operations for the vital Ferrying Command. Larry Fritz was the first pilot to fly a load of air-mail in commercial service and has logged 9,000 hours of flight time. His airline experience will be used to speed up the gigantic task of the job of getting the warplanes to the front lines, a 25,000-mile airline!

Wing Commander Henry R. Graham of the Royal Air Force was recently nominated Britain's Number One bomber pilot by the London Daily Herald; it was he who led the devastating attacks upon the Renault and other aircraft factories in and near Paris recently. His gunner: a 42-year-old American, Sergeant George Eric Mitchell, of San Francisco, California!

Lieut.-General William S. Knudsen recently completed his second nation-wide inspection tour and FLASH NEWS was on hand at the luncheon given in his honor. Said "Big Bill": "I'm still betting on American industry to pull this job through. We must think of a united American production effort, for a bullet will kill a Jap just as dead no matter if it came from Los Angeles or Springfield, Ohio! In every city I've visited in the U.S., I've seen the same urge among the workers—to do more tomorrow that they did to-day, more next week than last. You might call that Pollyana stuff. . . . I call it faith!"

VICTORY

SKYWRITER'S LIBRARY

MODEL AIRPLANE DESIGN and Theory of Flight, by Charles Hampson Grant (Jay Publishing Corp., New York City) 528 pages. 205 illustrations. $3.75

It is significant that all of aviation's pioneers, without exception, began their experiments with models. None will doubt that model airplanes, as a science, has, for nearly a century, been the foundation of all aviation progress, has made our modern transports and bombers possible.

One such youthful pioneer was Charles H. Grant, who began the scientific study of flying airplane models a quarter-century ago and has never wavered from his task of demonstrating the possibilities of the model airplane as a technical engineering factor. For ten years he has prepared a veritable maze of scientific data for presentation in an easily understandable form for the ever-growing army of enthusiastic modelers.

The contents of his book, "MODEL AIRPLANE DESIGN and Theory of Flight," demonstrates the size of his task, for within its 528 pages are crammed all that need be known by the serious model builder; from the basic, underlying theory of the science to the most detailed analysis of construction for specific qualities. This book puts many supposedly authoritative works on the design of full-scale airplanes to shame by the sheer weight of formulii, graphs and principles illustrated in its 205 diagrams and charts.

Certainly it represents the fulfillment of that thirty-year void in model textbooks, the culmination of the author's life task, the solution to the modern modelers' problems and lays the groundwork for future development of model building as the true science that it can be and the vital, moving force behind youth's skyward dreams.

TALLY HO: Yank in a Spitfire, by Pilot Officer Arthur G. Donohue, Royal Air Force. (MacMillan—$2.50.) 190 pages. Eight illustrations.

One cannot help reading with certain misgivings of the exploits of those intrepid airmen who fought and flew in World War I in the light of the deluge of "pulp" fiction, which has so hazardously and almost maliciously drowned truth in a great typhoon of ridiculous

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fiction.

Taking their cue like trained seals, these cent-a-word geniuses leapt to the parapet of World War II without so much as changing a syllable of their tried-and-true formula. Thus, before the first word of truth could spring from the heroic exploits of the Royal Air Force, their exploits had been fully nurtured (and tortured) in falsehood. And so, refreshing it is to take in hand this straight-from-the-shoulder account of one man's battle against the Luftwaffe. With each word ringing true by the sheer solemnity of its modesty, this story strikes home to those who want their history untarnished, their accounts uncolored. Donohue has a warm yet vivid style which moves forward across many months of hell over the Channel as easily as a fortnight at a beach resort. His inclusion of R. A. F. slang, organization, description of equipment and knowledge of the airman's soul make this story a welcome treat. Donohue has returned to the flying front and, at last reports, was still carrying his story forward in heroic action with the Fighter Command of the R.A.F.

HORIZONS UNLIMITED, by S. Paul Johnston. (Duell, Sloan and Pearce, Inc.—$3.75.) 354 pages. Nearly a thousand photographs.

Here, truly, is the story of aviation, from yesterday's earliest dawn to tomorrow's vast darkness. Told in the author's noted style, this story takes the reader on a whirlwind trip through man's memories of flight and his attempts to solve it, not just to get aloft, but to fly further, faster and longer. Divided into four main sections, the first describes the airman's playground: the sky; the second tells of airplanes, what they are and how they fly, the third deals with those "strange" contraptions, ornithopters, helicopters, autogiros, gliders and finally the modern airplane. Included, too, is the story of the balloon and the airship all culminating in an epilogue of conclusions after a thorough overall analysis.

We had the pleasure of reviewing this same author's FLYING FLEETS a few months ago and, while an earlier work, this volume further indicates the thorough-going manner of his research and the logic of his conclusions. No layman, S. Paul Johnston is Coordinator of Research at N.A.C.A. and within his memory are most of the outstanding years of aviation development. This book, written first, laid the background for his later FLYING FLEETS and FLYING FORTRESSES, the latter to appear soon and which we hope to review shortly. These three books will serve well as the complete and authoritative history of aviation which has long been awaiting presentation.

ELEMENTS OF AVIATION, by V. E. Clark. (Ronald Press—$2.00.) 193 pages. 36 illustrations.

This book, by one of aviation's most renowned pioneers, is an attempt to answer the young man's questions as to "what makes it fly," etc., and in this mission it does not fail. More than that, this volume clears up in a few, brief words many questions which have long stumped the experts. Its chapters: Airfoils, Air Flow, Stability and Control, Propellers, the Atmosphere, Airplane Parts and Weights and Dimensions, deal briefly yet thoroughly with all the necessary basic principles which must be clearly understood by those whose interests lie in the aeronautical engineering field. Concerning the author, he has been an airplane pilot since 1913, held ranks in both the Navy and Army and served with the N.A.C.A. where he developed the famed "Clark Y" airfoil which bears his name. He was, for some years, Chief Aero. Eng. of the Army, and out of his wealth of experience has come this handbook to aviation which will serve the student well.

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